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Women's Bureau
United States Department of Labor
Washington, D. C.

Women's Factory Employment in an Expanding Aircraft Production Program

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May 1941

Based chiefly
on visits to

Voight-Sikorsky - Stratford, Conn

Curtiss Buffalo

Plants visited:

Curtiss-Wright, Buffalo
Voight-Sikorsky, Stratford, Conn.
Douglas, Santa Monica, Calif
Vultee, Downey, Calif
Lockheed Vega, Burbank no women
North American, Inglewood no women
Consolidated, San Diego no women

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WOMEN'S FACTORY EMPLOYMENT IN AN EXPANDING AIRCRAFT PRODUCTION PROGRAM

INTRODUCTION

The American factory was developed upon the premise that women form its principal work force. While their proportion in manufacturing industries has decreased since agriculture claimed a smaller proportion of men, there has always been a seasoned, hard-drilled group of women workers in manufacturing industries. A sizeable proportion have been employed regularly in the fabrication of metals, especially in the production of cutlery and edge tools, hardware, tinware, wire work, electrical machinery and apparatus, typewriters, sewing machines, clocks, watches and time-recording devices, instruments, gas and electric fixtures, stamped ware, shell and shell parts, and other metal products. Through such production they have demonstrated their ability to operate satisfactorily punch presses, drilling machines, milling machines, lathes, grinders and polishers, as well as to achieve a high record in inspection, assembly of small parts, soldering, filing, and other bench work.

At the close of the World War 23 percent of the employees in 40 airplane factories were women. In Germany and Great Britain present reports indicate 40 to 50 percent of the employees are women. In the United States at the present time women form an infinitesimal proportion of aircraft factory workers.

This situation has arisen primarily because of the great demand upon the part of men for aircraft jobs. Neither large numbers of men nor women had been trained in aircraft manufacturing when expansion became necessary. Apprenticeship training was established for men and public and private vocational institutions catered to men. Even to-day only a few women are to be found in airplane manufacturing courses.

However, a program of expansion and maximum production calls for the best person for each job, regardless of sex. With this in mind, the Women's Bureau visited seven aircraft plants assembling bomber, pursuit, observation, and training planes. In several plants where the monocoque type of construction prevailed, although one was producing the tubular steel welded fuselage, a careful analysis was made of jobs in relation to their suitability for women. In others, comparisons were made of differing plant set-ups and the possibilities of adding women to plant personnel was discussed with department heads. While approximately 100,000 workers were employed in the plants visited, in three there were no women employed and in the other four only a fraction of 1 percent were women. The few women who are employed are working chiefly in the sewing of covers for rudders, ailerons, wing tabs, and other control surfaces of the empennage, and a smaller number were making parts before painting and doing minor jobs on electrical assemblies, wrapping and identifying gas lines.

SUMMARY OF SUGGESTIONS AS TO WOMEN'S EFFECTIVE EMPLOYMENT IN AIRCRAFT FACTORIES

The World War demonstrated that in an emergency some women make good on any job if adequately trained. However, this statement of the work women can do as satisfactorily if not more satisfactorily than men is based on the law of averages, that is on what many women have done or are doing in other industries and can do in the aircraft industry after a limited amount of instruction.

In every department of the aircraft industry, as now organized, there are varying proportions of occupations in which women may be employed as the industry expands to an employment of one million workers, the employment forecast for the end of 1941. In all departments there are jobs deemed not suitable for women, either because the work is beyond the average woman's physical strength, 570/1000 that of man, and resistance, 679/1000 that of man, or because the work requires lengthy experience and training which the emergency does not permit.

However, many of the jobs which women can do most effectively are to be found in production departments, such as machine shop, the press and forming, metal fabrication, bench and stainless steel assemblies, the assembly of the fuselage, wings, control surfaces, cowling, fairing, tank, final assembly, painting, covering, heat treating, anodizing, and welding departments. From a practical standpoint at the present time, departments which are concerned with the design, lay-out making and repairing of patterns, molds, templates, jigs, fixtures, tools, experimental planes, and

in the service departments require a high degree of mechanical skill and experience which few women have or could obtain in a short period. In the foundry, shipping, receiving, trucking, and maintenance much of the work is intermittently heavy and concerned with cumbersome parts. The jobs involved in these departments, however, include not more than 15 percent of the total factory employment.

As a conservative estimate it seems reasonable that at least one-fourth to one-third of the jobs in the aircraft assembly plants might be filled satisfactorily by women.

As a summary suggestion the following is a list of the principal jobs on which women may be employed effectively:

MACHINE OPERATORS
- Drilling, reaming, countersinking on single, multiple drills, and pneumatic drills
- Small milling machines
- Small turret lathes
- Small and medium sized punch presses
- Small angle bending machines and brakes
- Light grinders
- Riveting and dimpling machines
- Spot welding

BENCH-WORK
- Burring and filing of all kinds
- Soldering
- Hand forming over templates and blocks
- Tube cutting, bending, and assembly
- Electrical assemblies
- Wiring and bending
- Subassemblies in jigs and at benches

Hand and machine sewing of covers and fabric accessories

Stretching of covers on plane surfaces

Doping

Painting - spraying of small parts, stenciling, applying decalcomanias, masking, touch up, etc.

Racking in paint, heat treat, anodizing, and plating departments.

Detail inspection of parts and subassemblies

Departmental factory clerks and assistants in planning, parts control, blue print despatching, and drafting

Tool room attendants

A fear seems to pervade the aircraft assembly plants' personnel managers of employing men and women side by side in the shops. As a beginning women might be tried out in the subassembly and bench work departments where there is considerable light repetitive work, work on the control surfaces of the empennage, and on metal fabrication of small parts. Here large numbers of women could be used and men released for heavier work.

The predominating job throughout the assembly of an airplane is riveting, along with its concomittant processes of drilling, countersinking, dimpling, and bucking. Not all, but a large proportion, of the work of this kind might be done by women and the training of girls as riveters appears to offer definite possibilities as a source of labor for an industry rapidly expanding its working force and for women seeking jobs.

DETAILED STATEMENT OF WOMEN'S EFFECTIVE EMPLOYMENT IN AIRCRAFT FACTORIES

Departmental set-up and organization are not standardized, varying with size of the plant and the degree to which specialization and subdivision of operations is carried on. In general, however, the following are departments or divisions which were common to all plants.

PRESS AND METAL FORMING

A press and metal forming department of an aircraft factory which includes Draw Bench, Drop Hammer, and Sheet Metal Departments generally comprises less than 10 percent of the total factory workers. It is estimated that 20 percent of the work could be done by women.

This department cuts and forms metal parts to specified sizes and shapes for the fuselage, control surfaces, wings, cowling, etc. After the rough cutting, blanking, or shaping of the parts they are either fabricated in this section or sent to a special fabrication department or one of the respective subassembly divisions. Different plants have varying amounts of bench work within the press and metal forming department, depending upon the particular plant organization. Many of the bench work jobs, such as pneumatic drilling, burring, hand bumping of small parts over templates or wooden blocks, can be performed by women.

Punch presses are used to blank, form, and pierce webs, bulkheads, stringers, plates, ribs, gussets, reinforcements, etc., and in perforating slips and notching skins. Much of the work is on small and medium sized punch presses which are light and simple to operate; this work can be

done by women with very little training. Women can also do much of the drill press work on gussets, ribs, bulkheads, stringers, clips, skins, etc., most of the drilling being done with templates and jigs. Roll forming of lighter parts, angle bending on small brakes, cutting of metal with unishears, and cutting parts on nibbling machines are all functions which a woman can perform effectively.

Much of the other work in this department is very heavy and unsuitable for women because it involves the handling and cutting of large sheets of metal on power shears, and shaping and bending of metal parts with drop hammers, hydraulic presses, stretch and drawing presses, power brakes, and large power hand rollers. Large power hammers are used to shape and smooth metal contours, and hand bumping is used in forming large metal pieces over wooden blocks or metal dies; both of these operations require a knowledge of shrinking and stretching properties of metal and skill in getting the metal to flow into its required shape without cracking or wrinkling.

Profilers or routers are used in trimming metal, the parts being clamped into a block and manually fed against a rotating cutter. This work would be too heavy for women because of the strength needed in manipulating the profile block against the cutter. There is a variety of saws (band saws, circular saws, etc.) used in cutting metal, and since the operation involves physical hazards there is question as to the advisability of having women operate any of these.

PRODUCTION MACHINE SHOP

In the machine shop parts from the press and raw stock departments are machined on the various kinds of lathes, milling machines, drill presses, broaching, boring, honing, profiling, and other machines. In this section the jobs in the production machine shop are considered and not the machining of tools, dies, and special parts which require skilled mechanics. In the production machine shop the majority of the workers are operators who are not required to have all-round mechanical skill and experience.

Not more, and usually less, than 10 percent of the employees in an aircraft assembly plant are in the machine shop.

At present most of the machines are set up and run by the operator, with the set-up being checked by a leadman. Many of the runs are of fairly short duration, requiring relatively frequent changes compared to most metal industries. On the lighter machines many of the set-ups are not exacting and can be done by the woman operator; on others, where the runs are of several hours duration, the set-up of the machines can be assigned to special set-up men.

Women can be employed on a number of the machine shop jobs and might constitute at least one-fifth or one-fourth of the operatives

Drill press work is significant in the industry. After a short training period women can carry on at least one-half and probably two-thirds or three-fourths of the drilling, reaming, spot facing, and countersinking of parts such as bearings, flanges, levers, nuts, clamps, etc. The set-ups

for most of the jobs on a drill press are simple, with much of the work being done on jigs with prescribed standards for speeds and tooling.

Milling machine operation is another possibility for women. Ailerons, stabilizers, tubes, fittings, and other small parts are machined on light milling machines where only minor decisions have to be made in adjusting the machines and where the replacing of cutters and set-up of fixtures and chucks are not heavy, probably being done as well by a woman machine operator as a man.

Light turret lathes and hand screw-machines shaping the cylindrical surfaces of bars or rods for small parts are other machines on which women can be employed. The set-ups are more exacting and diversified than drill presses or small milling machines but after some experience on simpler machines women have worked successfully on them.

There is a considerable amount of grinding which is of a repetitive nature and though tolerances on grinding are very fine and the setting of the work and grinder is exacting, women who had demonstrated their ability on other machines could do straddle and other grinding on parts such as pistons, small bars, cylinders, and others that are of light weight. Tapping and thread grinding is another definite possibility.

Bench jobs of cleaning parts by hand burring with files and scrapers and straightening bar stock in arbor presses would be the simpler jobs on which women can be introduced and given a chance to show their work propensities.

On the other hand, it does not seem that the operation of engine lathes, shapers, large automatic screw machines, broaching, large boring mills, radial drills, heavy grinders, and other more unusual machines are advisable for women. The set-ups are intricate, requiring experience and skill; and lifting of heavy parts make the employment of men preferable.

METAL FABRICATION, BENCH WORK AND SUBASSEMBLIES

Most of the parts that come from the press and cutting departments require a certain amount of intermediary processing before they become a part of the fuselage, panel, or other assemblies. The amount and nature of the work which is done is segregated fabrication and bench detail assembly departments vary with the organizational set-up of each plant, but the tendency seems to be for an increasing break-down of operations with more subassemblies and bench work. Approximately 10 percent of the factory workers in the two eastern plants visited were in metal fabrication and bench assembly divisions.

Metal skins of all sizes are reworked; stringers, ribs, webs, and bulkheads are checked and lined up on the bench; and parts such as junction boxes and instrument panels are drilled and assembled. Armament parts, ammunition boxes, chutes, firewalls, and numerous other parts and fittings of stainless or cold rolled steel are fabricated and assembled in separate bench divisions. Edges are trimmed and burred, holes are drilled or spot faced, and some parts are set up in jigs or fixtures with temporary clips and screws as a subassembly for later riveting or welding. Tack welding and spot welding are used for some of the subassemblies. Drilling and reaming with pneumatic hand drills and riveting of light parts are common operations.

While some of the work in the fabrication and bench assembly sections is technical and complicated, most of it is the kind that women can do very well. Bench jobs requiring finger dexterity, careful following of blue print and work orders, checking with micrometers, scales, and gauges, and the use of simple tools such as screw drivers and files, arbor presses and vises have been held by women for years in electrical appliance and other metal working plants, and undoubtedly at least one-half of the bench work in the aircraft industry could be carried on expeditiously and efficiently with women operatives.

TUBING

Thousands of feet of tubing for fuel, oil, coolants, oxygen, hydraulic and electrical conduit lines are a part of every plane. Tubes are cut, bent, and assembled into subassemblies for installation in wings and final assemblies. Only about 1 percent of the factory employees are in this department. While the work must be done with precision and care, most of it is light and simple and has served as one of the beginning jobs for men and can be done equally as well by women. The training period either in a class room or the shop is not more than a few weeks.

Tubes are cut to prescribed length and then either bent by hand or machines which are set up with controls for angle and direction of the bend. The ends of the tubes are flared, flattened, beaded, or otherwise finished to definite specifications by hand or machine. Washers are inserted and the ends sealed after testing and inspection. Tubes are numbered and sorted for final installation. All of the jobs seemed of a kind that women could carry out.

CABLE

The cable department is another of a bench work type, and is of only minor significance in the numbers employed. Heavy duty cable, bonds, and flexible conduits are cut, spliced, and soldered. Bushings and fittings are attached and the strength of the cable tested. Since it is usually a small department the work is varied with some of the work on heavy cables, requiring considerable strength and tending to cut the hands and fingers in handling. If the size of the department warrants specialized work on the lighter cables for conduits, bonding, and antennas, this work might be done by women but it did not seem probable that the cable department might take many women.

ASSEMBLY

The assembly of the plane sections is performed in a variety of major subassembly departments, and the extent to which the assembly functions are broken down into separate departments varies from plant to plant. However, the major plane sections to be assembled are the fuselage, wings, control surfaces, and cowling, and all of these are ultimately brought together in the final assembly department.

Fuselage Assembly

In the fuselage department the bulkheads, ribs, stringers, longerons, brackets, firewall, skins (metal surfaces), windshield, cabin, etc. are brought together by assembly into progressively larger jigs until completion of the fuselage — long center structure of the plane which holds the cockpit, cargo, etc. and to which the wings and tail are attached.

In addition to assembly of the fuselage there is also a good deal of metal fabrication, bench work, and small subassembly work which serve as a fuselage detail section supplying the larger jig assemblies.

Less than 10 percent of the factory workers are in the fuselage department. Approximately 20 percent to 25 percent of the jobs in this department can be performed by women, provided they are trained in riveting which is the most common job throughout assembly.

The bulk of the work in fuselage detail is simple riveting and detail bench work, and women can be used on both of these. Operations included are drilling, reaming, countersinking, dimpling, hand and machine burring, putting in screws preparatory to riveting. Women can do the riveting of subassemblies in small jigs using all types of riveting equipment—gun, hand squeezer, and compression. The entire interior of the fuselage is air cleaned as a last step prior to sending it to the paint shop and women can do this to advantage.

The bulkheads, stringers, longerons, and ribs are assembled in jigs to form the structural parts for the fuselage. This is very exacting work requiring all-round skilled assemblers who have a mechanical background and ability to work from blueprints. Much of this work and the actual fitting of the skin on the fuselage involves climbing, lifting of heavy parts, and working in strained positions, thus making it an undesirable section in which to employ women.

Wing and Control Surface Assembly

Wings are composed of the leading edge, inter-spar section, trailing edge, wing tip, and internal attachments including ribs, beams, webs, and stringers. The various types of control surfaces (empennage movable surfaces) are ailerons, stabilizers, elevators, rudders, slots, fins, and flaps; the internal structure of these is practically the same as in a wing panel, but on a smaller scale.

Approximately one-fourth of the factory workers are in either the wing division or control surface division, and in the two eastern plants visited it is estimated that women could do about 35 percent of the work on wings and almost twice that percentage of the work on control surfaces. The latter are so much smaller than the wings that there is opportunity for a far greater range of jobs for women, and possibly whole sections in the control surface division could be filled by women working under the direction of leadmen.

Just as in fuselage assembly there are subassemblies in progressively larger jigs until the wing or controlsurface is completed. The jigs are made with such accuracy that the parts must be properly placed in the fixture or they will not fit, thus making them almost fool-proof and decreasing the number of all-round skilled assemblers needed. Most of the work on control surfaces is bench work and small subassembly involving drilling, reaming, countersinking, dimpling, burring of small parts, fitting of skins with clips and fasteners, inserting screws, placing rivets in holes for gang riveting, and riveting (gun, hand squeezer, compression, and gang riveting). Women could perform most of

the work except the heavier and more complicated assemblies requiring an all-round assembler who can perform several tasks, read blue prints, make assemblies without the use of a jig, and also direct the work of some of the less experienced employees. Some of the control surfaces are fabric covered and the frame work of these is sent to other departments for covering, doping, and painting.

Most of the opportunities for women's work on wing panels will be found in the detail wing division where there is bench work and sub-assembly work similar to that on control surfaces. Additional work which women could do includes application of neoprene tape to gas tank seams, bonding of movable parts, putting safety wiring on nuts and bolts, and putting in elastic stop nuts, all of this being done on the smaller sub-assemblies. Women could do the final air cleaning of the wing before it is sent to the paint shop.

Assembly of the main wing panel involves moving and handling large and heavy wing sections, considerable climbing and stretching, and working in cramped positions, thus making it an unsuitable task for women. In this stage of assembly there is additional drilling, lining up of parts, riveting, and installation of aileron controls, gun charging pulleys, bomb control brackets, electrical conduit boxes and lines, wing panel lights, attaching of wing tips, etc.

Cowling and Tank Assembly

Approximately 10 percent or less of the factory employees are engaged in the assembly of cowling, tanks, fairing, cabin hoods, and windshields, and about 20 percent of the work is of a type that could be performed by women.

In general, cowling includes metal covering for the engine, nose, landing gear, and speed ring, and it is not a structural part of the plane. The amount of metal forming and fabrication done in this department varies with the type of plant organization and the extent to which metal fabrication has been centralized. Any heavy duty metal forming and cutting machines such as power shears, large brakes, power hammers, profilers, rollers, etc., as in the press and forming department, would be out for women. The fitting and assembly of large metal pieces, and the final assembly of the cowling to the engines, landing gears, etc., would also not be suitable.

In any cowling division there is some detail bench and subassembly work that women can do, most of the assemblies being made in jigs and fixtures. This would include the usual drilling, countersinking, buffing, burring, polishing, simple grinding, light hand bumping, some roll forming of light parts, inserting of temporary screws and fasteners for riveting, and riveting.

Women can also do some of the lighter bench work on windshields and cabin hoods, installing Plexiglas and laminated glass, occasionally putting rubber tubing around the hood edges, and putting rubber compound around seams and grooves.

Tanks are made for gas, oil, prestone, water, etc., including their necessary fittings and baffles. Most of the metal forming jobs involving the use of hand brakes, saws, rollers, shears, and sand bag forming are definitely heavy work and out for women. Any hand hammer riveting and dimpling that might be done would also be too heavy, as would tank testing in large baths. The occupations in which women could best be used include soldering of screens, oil coolers, filters, etc., light riveting, rolling

beads on baffles and light metal pieces, punching and drilling holes, assembling small parts and fittings, lock wiring fittings, burring and grinding small parts, and rubber cementing of certain tank seams.

Final Assembly

The fuselage, wings, control surfaces, cowling, engine, instruments, etc. are brought together on the final assembly line. The wings are mounted on the fuselage, the control surfaces are attached, the engine is installed, the controls, tubing, conduit and junction boxes, instrument panels, control boards, charts, guns, ammunition, etc. are installed. There is an increasing tendency for as many assemblies as possible to be made before final assembly, and for much equipment, wiring, tubing, etc. to be installed in the major sections of the plane before reaching final assembly.

Less than 10 percent of the factory employees are in the final assembly department and not more than 15 percent of the work could be done by women.

There generally are some relatively small feeder shops off the final assembly line for the assembly of accessories, controls, electrical devices, etc., and practically all of the more suitable jobs for women are found in these feeder shops rather than on the final assembly floor. For instance, women would be especially adaptable for most of the work on electrical assemblies such as cutting wire, putting identification tags on wiring, soldering terminals, light sockets, and fittings, assembling a variety of instrument boards, switch boxes, panel boxes, etc. Other bench work for women might include lock wiring, bonding, and putting fittings on

engine accessories including oil coolers, oil drains, carburetors, fuel pumps, temperature regulators, etc., and assembling engine control rods, control cables, chutes, racks, pulley housing, etc.

Much of the work on the final assembly line involves crawling in and out of narrow passages, working in strained positions, climbing around the outside of the ship, and working from quite high platforms, thus making this an undesirable place in which to employ women. Also, as yet there is not a high degree of specialization in jobs and instead each assembler must work interchangeably on several tasks. There often is a segregation of work so that one group works on power plant assembly, another on control surfaces, another on engine controls, another on fuel and oil system, etc., but even so, each person does a variety of things that require some general mechanical knowledge. However, as production increases and more of a division of labor is used it would be possible for women to do some of the lighter tasks and those requiring the least amount of climbing. But for the present the final assembly line is one of the more untenable places in which to employ women.

WELDING

Torch Welding

When most planes were fabric covered with a skeleton of welded steel tubes to carry the construction strain the relative need for welders was greater than under the present monocoque type of construction. Engine mounts, however, are still steel torch welded assemblies and aluminum tanks, boxes of various kinds, stacks and other fittings of alloys are assembled and made tight with acetylene, oxygen, or hydrogen welding. Altogether,

however, torch welders make up less than 2 percent of all productive workers. Welding of this kind has always been considered a skilled job requiring training and years of experience to become adept and most of the welders in the aircraft industry are men with work histories of five and more years at their trade. The Army and Navy standards require all welders on stressed parts to pass an exacting test of their ability to lay smooth penetrating welds without burning the metal and these tests are repeated at periodic intervals. Although women were successful welders during the last war and are occasionally found in metal plants at the present time, the probability of any appreciable number qualifying without years of experience and long periods of training seems slight, and since only a small proportion of the force are welders the needs and possibilities for women as torch welders are negligble.

Spot Welding

New engineering developments are increasing the use of spot welding as a substitute for riveting in fitting the skins on parts such as the wings and control surfaces. Spot welding makes a smooth surface, is faster and cheaper than riveting, and its applications will probably increase so that the demand for spot welders should be an expanding one.

The spot welding operation is relatively simple. Voltage and amperage standards have been specifically worked out for the various metal thicknesses and weights and these can be quickly set up or checked by a leadman. The physical effort required to operate a spot welding machine is light and when the skin parts were cumbersome in size/in one plant visited they were suspended by hooks and pulleys from overhead supports. As a part

of the spot welding of skin parts, there are simple preliminary wire brushing operations to clean the surface and reduce resistance. After the weld has been made the part is rolled on a special machine to remove slight gaps and stresses, and is given a final buffing as a finishing process. On large pieces these last operations might be unwieldly for women but it is not heavy work. It seems that women could become adept at spot welding and although the present proportion employed on this job is small, the possibilities for future expansion would warrant the consideration of women's training as spot welders.

COVERING DEPARTMENT

The few women who are found in the productive division of aircraft manufacture are usually in the covering department and in this department their jobs are usually limited to hand and machine sewing operations. The structural skeletons of ailerons, rudders, elevators, and wing tabs are the only surfaces which are being covered with fabric to any extent. Women sew the control surface covers on regular single and double needle sewing machines and also sew covers for motors, tool kits, head rests, and upholstery parts. Men are usually employed to stretch the fabric to the proper tension and tautness and to do the rib lacing or rib staying which holds the cover securely in place. In one plant where a special order for dive bombers with fabric covered fuselage and wings was being filled, women were doing most of the taping of the structural parts - a preliminary operation before covering - and were helping with the stretching of the fabric. Stretching fabric covers on plane parts was considered a strenuous job by some of the men interviewed but the women in this plant were doing

it with apparent ease and dispatch. The ends of the covering were finished by hand sewing, using the base ball stitch. The covering and sewing room is a small department but practically all the jobs could be done successfully by women.

DOPING, PAINTING, AND ANODIZING

After the control surfaces have been covered several coats of dope - liquid acetate paint - is applied to the fabric surfaces to make them taut and waterproof. Finishing tape for extra reinforcement over the ribs is attached before the final doping coats are applied. All doping was being done by men but might be done by women.

Before many of the parts are assembled they are sent to the paint department for anodizing to build up resistance against corrosion. Anodizing is an electro-chemical process and the suspension in large tanks of the parts on overhead hoists or racks is similar to plating. Some parts are cadmium plated. In the plating and anodizing processes only a few are employed and about the only work that could be done by women would be wiring small parts and hanging them on racks and unracking after the operation had been completed.

In the paint shop large assembled parts are sprayed in paint booths by skilled painters. The men usually wear transparent shields and the working conditions in the paint shop are disagreeable - fumes and spattering paint covering and stiffening clothing and shoes. Some small parts are painted in table booths and others are dipped. Surfaces and parts not to be painted are masked with paper and various kinds of masking tape. Decalcomania

transfers and stencils are used in the painting of insignia, numbers, letters, and other special designations and inscriptions on the plane.

Women occasionally do masking in the paint shop and might be employed for practically all of this work. They could also do spray painting of small parts, rack parts for dipping, and serve as general helpers. In general, however, the work of the paint shop does not affect large proportions; even though women can do the work, it is not one of the most desirable places in which women might be placed.

HEAT TREATMENT

Many metal parts are heat treated to normalize the strains, to give tensile strength or to change the physical properties of the metal while in process. Sizes of the pieces handled vary from very small to very large. Some metals are heat treated in electric ovens and others in chemical baths, with various methods of cooling naturally or by immersion in or spraying with liquids. Small parts are wired together for heat treatment. Certain parts such as bolts, nuts, and screws are given insulating coatings of substances such as asbestos cement and the application of this coating is light work. The numbers involved in the department are small, only a fraction of 1 percent, and about the only job the women might do would be to serve as helpers on light wiring of parts, cleaning, and applying oil coatings on steel before heat treatment. Heat and fumes from the ovens and tanks make this a disagreeable working place and, like the paint department, it is not a section where many women could be used satisfactorily.

About 10 percent of the jobs in aircraft are in the tools, parts, and production control and the inspection divisions which are not directly productive.

INSPECTION

Every part and every job has specific standards in aircraft which must be met. Inspectors check parts and operations at almost every step and constitute 5 and more percent of the total factory force. In most instances inspectors work on the factory floor along side of the operatives and must be thoroughly familiar with the construction and technique of aircraft production. Women are not experienced enough in the industry to serve as floor inspectors on complicated assemblies. However, in the departments which have special sections inspecting incoming parts and small subassemblies, women could be used advantageously. Testing on hardness testing machines such as the Rockwell, inspection with gauges, micrometers, and checking to simple blue print specifications could be done as well by women as men, and such inspection jobs are now held by women in the aircraft engine and instrument plants and many other metal working plants. At least one-fourth of the inspection could be done by women and in case of a dearth of male workers considerably more.

TOOL ROOM

Tool grinders and repair men are skilled all-round mechanics working to high degrees of precision with close tolerances and it is not probable that women could qualify for such work. In the tool crib, however, where tools, dies, and small parts are issued, women might well be used.

Tools must be kept in their proper boxes or bins, and check-out tickets and receipts are issued. Tool room employees must be familiar with types, sizes, and properties of the tools.

A knowledge of decimal equivalents and ability to read micrometers, scales, and other gauges is needed. The work of checking out tools and keeping records is of a storekeeper's nature. Similar work in the receiving and stores division could be done by women.

PRODUCTION PLANNING AND ROUTING

In the planning department the jobs are largely those of factory clerks. The keeping, routing, and dispatching of blue-prints could be carried on by women, and also clerical work in the charting, issuing of orders, and checking the progress of component parts and assemblies. Production schedules are set up for each part and usually for each worker. Maintaining these standards is part of the supervisory duties of the foremen but clerks from the planning department often have to follow up parts and re-route work on the floor for additional processing, which requires a knowledge of plant methods and lay-out. As their experience in the industry accumulates women should be able to fill these jobs as well as those that are more strictly clerical.

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WOMEN'S BUREAU
U.S. DEPARTMENT OF LABOR
Washington, D.C.

EMPLOYMENT OF WOMEN IN THE MANUFACTURE OF SMALL ARMS AMMUNITION

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Based on visit to Frankford Arsenal, Philadelphia
(per EE)

EMPLOYMENT OF WOMEN IN THE MANUFACTURE OF SMALL ARMS AMMUNITION

Ammunition for small arms is of major importance in the aircraft defense program. A single airplane in firing action equipped with eight or more machine guns is reported as pouring out a stream of 1,200 rounds of ammunition a minute from each gun. With tens of thousands of planes carrying machine guns, the demand for small arms ammunition is potentially prodigious. Manufacturers of ammunition for small arms (hand and shoulder weapons and machine guns and automatic weapons of all sizes up to .50 caliber) have modernized and revamped their old plants in the East and are to operate new government built plants in St. Louis, Lake City near Kansas City, and Denver. The Frankford Arsenal has doubled its personnel in small arms ammunition several times in the last two years. Further, many of the government contractors are furnishing component parts or complete rounds of small arms ammunition.

Since the small arms ammunition industry has a small product, a standardized one as to operations and machining, and one which requires considerable care and attention to detail, women have been used extensively, and as the new plants get into production many more women will be employed in this branch of the defense program. In the government arsenal at Frankford approximately 40 percent of the productive workers are women, and if the dilution of labor should increase, women undoubtedly would constitute a considerably larger proportion.

Women comprise a much larger proportion of the munition makers in England than in this country. In a recent issue of the London Times - May 11, 1941 - a representative describing a visit to the new Royal Ordnance

plant in Wales reported that 80 percent of the workers were women. None had more than seven months' experience and the majority had less. A supervisor expressed the opinion that a typically intelligent girl trained in the factory was as efficient at her work after six months as the average boy who had worked longer.

SMALL ARMS AMMUNITION

Ammunition for small arms is less than one inch in diameter and the most common types and calibers are .30, .45, and .50. Caliber is the diameter of the bore or cylinder of the weapon from which the cartridge is expelled and is stated in one-hundredths of an inch. The parts of a round of small ammunition include (1) the bullet or projectile, which is a metal slug or core enclosed in a light gilding metal jacket, and (2) the cartridge case, which holds the primer and the propelling charge and when assembled with the bullet makes the complete unit. The primer is a small loaded cup set in the base or head of the case which explodes when struck by the blow of the firing pin and ignites the propellant, which ejects and dispatches the bullet from the weapon.

The types of bullets are: "Ball" for use against persons and light targets; "armor-piercing" for attacking objects heavily reinforced with armor plate, concrete shelters, and other bullet-resisting targets; and "tracer" for observation and incendiary purposes. The ball bullet has a lead alloy or slug or soft steel core, the armor-piercing has a hard core usually of tungsten-chromium steel, and the tracer has a compressed igniting and pyrotechnic charge which gives a bright flame and makes the path of the bullet visible or may ignite the object which it strikes.

The findings of this report are based chiefly on a survey of occupations of men and women in a government arsenal which for many years has manufactured small arms ammunition and tends to establish the methods and standards for this industry. Frankford

Summary of the Principal Operations in the Manufacture of Small Arms Ammunition and the Possibilities of Extended Use of Women.

	Sex of operatives (M - men; W - women)	Extension of women's employment
Bullet Manufacturing		
Bullet jacket		
Drawing (several draws)	M	Could be substituted in part for men.
Annealing, pickling, and washing	M	Not suitable.
Trimming	M and W	Proportion could be increased.
Bullet point or core		
Melt and ingot molding	M	Not suitable.
Extruding and forming	M	Ditto.
Washing and drying	M	Ditto.
Bullet assembly	M and W	Could be used entirely.
Tracer bullet charging	M and W	Proportion could be increased.
Case Manufacturing		
Drawing (several draws)	M	Not suitable.
Annealing, pickling, and washing	M	Ditto.
Polishing	M	Ditto.
Pumping, pocketing, and heading	M	Ditto.
Trimming	W	-
Head turning	M and W	Could be used entirely.
Body and mouth annealing	M and W	Ditto.
Tapering	W	-
Chamfering	M	Not suitable.
Primer inserting	W	-
Primer		
Blanking and forming cup and anvil	M	Could be substituted in part for men.
Shellacking strips for foiling	W	-
Pellet forming	M	Could be substituted for men.
Foil and knock out	W	-
Inserting of anvil	W	-
Press anvils into primer cup	M	Could be substituted for men.
Primer inverting	W	-

	Sex of operatives (M - men; W - women)	Extension of women's employment
Cartridge Assembly		
Loading machine	M and W	Could be used entirely.
Inspection - Visual, Gage, Machine	M and W	Ditto.
Packing and Labeling	M and W	Proportion could be increased.

TRAINING

Most of the work in the manufacture of small arms ammunition is carried on by automatic machinery and only short training periods are needed. All the training can be secured on the job under the tutelage of another operative; three to six weeks would seem sufficient for a learning period with a highly specialized and mechanized set up.

BULLET MANUFACTURING

Bullet jacket

The light gilding metal jacket which covers the core of a bullet is formed by a series of drawing operations similar to those on the cartridge case, except that smaller presses are used. Men are used exclusively for these operations, and though the tending of machines requires little skill and effort, one operator cares for as many as five machines and there is considerable moving of parts in process, filling feed hoppers, and moving finished jackets, all of which is manual work. With further dilution of labor, and providing that additional "move men" are employed for heavy work, women could operate the drawing presses for bullet jackets. The jacket between drawing steps is annealed, pickled, and washed several times in rotary electric furnaces and revolving drums. This work is all done by men and because much of it is of a heavy manual nature it would not be suitable for women.

Trimming was the only process on the bullet jacket which employed women as well as men. The trimming was done on a special horizontal spindle machine which was simple in operation and required only a short training period. It would seem that women might do all the trimming of bullet jackets.

Bullet point or core

Handling and feeding heavy bars of steel or heavy reels of lead to automatic machines which require the attendance of skilled set-up men does not require many workers and does not apparently offer any possibilities for the employment of women.

Bullet assembly.

The assembly of the bullet, the pointing or nosing of the jacket, the inserting of the slug, and the finishing operations employ both men and women. Women in a government arsenal are employed on the .30- and .45-caliber ball and armor-piercing bullets, while men are assembling the .50-caliber bullets and the tracer bullets. Two types of automatic machines are used, the older dial type and the newer straight line assembly press. The pointing or nosing, inserting of the slug, profiling, sizing, and canneluring are progressive machine processes, and the work proceeds automatically from one station to the next so that the operator merely watches the operation of the machine and sees that an adequate supply of parts is on hand and that all parts of the machine are working properly. Men adjusters condition and set up the machines. It seems that women might do all the work of bullet assembly.

On some of the bullets a special cannelure must be machined separately. A cannelure is a groove on the bullet which serves as a seat when the bullet is assembled into the case. On the .30-caliber bullets with the extra canneluring, this is a wholly automatic process and requires only the

setting-up of the machine and the filling of the hoppers, so men are used. On the .50-caliber, the bullets are hand-fed by women.

Cleaning and polishing

The assembled bullets are rumbled in drums filled with sawdust to clean and polish. This operation entails heavy lifting and is suitable only for men.

Tracer charging

Tracer bullets must be charged with tracer (a pyrotechnic powder) and igniter mixture. The bullets are placed in die blocks, topped with die-funnels, passed on by conveyor belt to the charging machine which automatically weighs and compresses the powder charge, and then moves on to the ejecting machine operator, who inspects the charge and ejects the bullets with a press from the die blocks. Usually there are five operators to a tracer-charging group. On the .30-caliber tracer bullets, women are employed for seating the bullets in the die block and placing the funnels. Other jobs on the .30-caliber and all jobs charging the .50-caliber tracer bullets are loaded by men.

While it seemed that women might do all the jobs on the charging of tracer bullets, there are certain conditions of employment which would require that women of more than average strength and stability be selected. The die blocks are moved on conveyors but they must be handled, lifted, and pushed about on the work bench and since they weigh as much as 14 pounds apiece and some of the men workers handle as many as 30 a minute, there are elements of cumulative fatigue involved. While the amount of powder allowed in the charging machine is limited, and there is little hazard of a major nature, there may be an occasional flare-up from accidentally ignited powder

with a possibility of burns, and the operative must be emotionally stable and able to continue at work without tailing.

CARTRIDGE-CASE MANUFACTURING

The cartridge case which forms the base of the complete round is made of one piece of brass by several drawing and machining processes. The case when assembled contains the primer, the propellant powder, and the bullet in a waterproofed, airtight unit.

Drawing operations

A small heavy brass cup of prescribed size and weight for the various calibers which has been drawn by the brass fabricators is the starting point for the further drawing operations. There are several drawing, bumping, pocketing, and heading operations in the shaping and elongating of the cases which are performed on large crank presses by men. To permit further draws and to secure the required physical qualities of the metal, the cases are annealed, pickled, and washed several times during the drawing and machining. The annealing processes are considered unsuitable for women because they involve moving trucks filled with cases, heavy lifting, and general manual labor to which women are not suited. In the government arsenal visited the sentiment was that the drawing and allied operations were not suitable or desirable jobs for women. The draw-press operators, in addition to tending their presses, keeping the feed lines clear, and making visual and gage inspections of the cases in process, must do manual work moving filled carts, fill the coolant reservoir with soapy solutions, keep the hopper filled with cases, - the two last named requiring heavy lifting - and occasionally must mop up the floor around the presses, which becomes spattered with oil and coolant.

Most of the time the operator of a drawing press must stand. Also, the draw-press room resounds with the din of the presses, the floors are slippery, and in spite of guards on the presses there is danger of finger injuries. While women might be used as draw-press tenders, it seemed of slight feasibility. The training period is short, a few weeks at most for draw-press operators, so women in case of emergency needs might be put on without any significent loss of time for a learning period.

Trimming

After the third and fourth drawing operations, the mouth (top) of the case is trimmed on a special horizontal spindle machine with rotating cutters. Women are employed for trimming and the learning or training period was reported as short, only about one week.

Head-turning

The head or base of the cartridge case holds the primer seat, the vent hole, and the extracting groove. An automatic screw machine cuts the extractor groove, machines the base, and countersinks the primer pocket as a continuous operation. The operator fills the hopper, watches the feeding, and makes occasional visual and gage checks of the cases. Machine adjusters set up and service the machines. Both men and women serve as operators, the former on the .50-caliber, and the latter on the .30 and the .45. Little training is required for the operation; move-men or truckers usually are promoted to headturning. The men operators usually assist with the moving of trucks. Women undoubtedly might do all the head-turning with the help of additional move-men for filling the hoppers and trucking off the finished work.

Body and mouth annealing

Before the mouth of the case is tapered, it must be annealed to secure the necessary physical tensile properties. This annealing process is carried on by feeding the cases on a worm-driven conveyor with the tops of the cases passing through a series of flaming gas jets while the heads are immersed in a water bath. The cases are hopper fed and the operator is a machine tender watching the feed and visually inspecting the process. Both men and women tend these machines and there seems no reason why women cannot do all such annealing.

Tapering

The body of the case at the mouth is tapered a bit to permit easier extraction of the case after expansion by the expulsion of the bullet. Two successive tapering operations are processed on a straight-line double-action press, which has automatic feed and controls. Women in a government arsenal were operating all the tapering machines, three machines being assigned to each operator.

Finish trimming

After tapering, a final trimming of the mouth is next in sequence and women do this operation. These machines also are of an automatic type and one woman may operate as many as four machines. The operator tends the feeding of the cases along a magazine track, watches the operations, and gages the trimmed cases at certain intervals. The operators walk from machine to machine and also make spot inspections of the cases to be fed into the machine for defects such as dents. The cutting parts of the machine are shielded, but there are some flying chips which afford a slight possibility of injury.

Chamfering

The final operation on the mouth of the case is chamfering the edge to put a slight flare which eases the insertion of the bullet. Chamfering requires a certain amount of mechanical ability in making machine adjustments, changing and sharpening the cutting tools when needed. Otherwise the operation proceeds on an automatic basis, the men watching the feeds, occasionally inspecting the cases much as in trimming. Women who are experienced in operating machines such as milling machines, grinders, and turret lathes could do this operation.

Inserting primers, cutting the vent hole, and waterproofing

The last operation on the cartridge case before it is ready for the final assembly with the bullet is inserting the primer, cutting the vent hole, and waterproofing. The primer is made up of a cup, a percussion pellet, foiling disc, and anvil which have been assembled before insertion in the case. The vent hole is an opening in the head of the primer pocket through which the flame from the primer passes into the case and ignites propellant powder stored there. All the operations of this final process are carried out on a straight line automatic crank press which has nine automatic stations which chamfer, punch the vent holes, inspect for "no-hole", seat the primer, crimp the head of the case to the primer, and waterproof with a drop of colored varnish between the primer and the case head. The job, again, is the tending of an automatic machine and women operators tend one or two machines. The training period is not more than a couple of weeks.

If the machines are not kept clean there is a possibility of an occasional "flare-up" from small particles of primer mixture that may have accumulated in the stations of the machine, but this is of rare occurrence.

PRIMER MANUFACTURING

The primer for small arms is a tiny brass cup which contains the pellet charge pressed to a foiling disc and a tiny anvil through which the flame from the ignited pellet passes into the vent hole in the cartridge case.

Forming of the primer cup and anvil

Small automatic presses blank and cup the parts for the cup and anvil. Men set-up and operate these presses. If women had the skill necessary to make the set-up, or if set-up men were employed, women could operate the machines.

Pellet forming

The pellet is a small explosive wafer which is placed in the cup under the anvil. The forming of this pellet is a hazardous job and the men doing this work in a government arsenal are classed as explosive operators. The primer mixture is rubbed into holes on a charging plate with a strip or piece of rubber, and pressure is applied to the charging plate to form the pellets. The work is carried on in a shielded booth with a glass shield that is pulled down while the pellets are being pressed to enable the operator to watch the pressing process. There is an explosive and fire hazard in this process and precautions are taken to safeguard against the spreading of fire from these booths or boxes. Only a few men are employed on this work, and except as hazardous jobs are undesirable for all workers there was no reason from the standpoint of strain and skill required why women could not do the work.

Primer foiling and anvil inserting

Strips of **foiling** paper to be made into foiling discs are shellacked by women. Women also operate the press which cuts or punches the discs and presses them down over the primer pellet.

The small anvils are placed in the primer cups by women. It is a simple hand operation and requires no training.

The anvils are next pressed into the primer cup on a toggle press. Men are used in the government arsenal on this job but the work was light and simple and might as well be done by women.

All the jobs in connection with primer foiling and inserting of the anvils, and in primer inverting, are light work and can be done as well by women. The drawback of the job is that there is an ever present though slight hazard of sudden fire explosion. This, however, is a strain for men as well as for women and the reactions and emotional stability of operatives probably are more affected by individual differences than by the sex of the worker.

Primer inverting

After the primers have been made they are tumbled from a hopper on a rotary disc until they fall right side up and then they are arranged in trays for feeding into the primer-inserting machines. Women are employed for this work, and after the trays are filled each one is visually inspected with a magnifying glass for defective primers. Six inspected trays are placed in small wooden cabinets and are turned over to the primer-inserting section. (Primer-inserting is the last job under case manufacturing.)

CARTRIDGE ASSEMBLY

A loading machine which fills the primed cartridge case with the propellant powder, inserts, seats, and crimps the bullet into the case, and lacquers the bullet point on tracer and armor-piercing with red or black, completes the operations on a round of ammunition.

Two types of loading machines are used but both have a sequence of automatic operations which spread the mouth of the case, load and weigh the powder propellant, check the weight of the powder, insert the bullet, seat the bullet at the correct position, and crimp the case mouth in relation to the cannelure. On the straight line-loading machine the last operation switches the bullet into an upside-down position while the point is automatically lacquered and dried, and then drops it off as a complete round into a move truck ready for final inspection.

Both men and women are used as operators on these machines, the women operating those which load and assemble the .30- and .45-caliber rounds and the men the .50-caliber. A period of five or six weeks was reported as necessary to become proficient and familiar with the tending of these machines. The straight-line machine has automatic feeds for the cases, powder, and bullets. Tracer bullets are hand-fed because in tumbling them from a hopper the tracer powder might become dislodged slightly and accidentally ignite. The operators who feed tracers wear gloves and work at a continuous speed of 60 to 80 a minute for .30-caliber and about 50 a minute on the .50-caliber. Two operators tend these machines, the one feeding and the other keeping the hoppers filled and watching the machine.

Women might be used on the other .50-caliber loading machines but it would be advisable to employ men to fill the powder magazines and the bullet and case hoppers, as the powder cans for the .50-caliber were reported as weighing about 30 pounds, or three times as much as for the .30-caliber, and

the bullets and cases also are much heavier. The operators normally fill the hoppers and lacquer pots.

Tending the loading machine is a standing job. There are possible hazards of injuring fingers in removing defective cases from the machine, and fires and explosions may occur from the igniting of the tracer or the propellant powder. The machines are cleaned and blown out with compressed air at regular intervals during the day. The operator must have the nervous stability of being able to work without undue strain under more or less hazardous conditions.

INSPECTION

Detailed specifications have been developed for all the component parts and stages of production. Inspection for defects in material and manufacture goes on continuously. The finished cartridges are given a final inspection to make sure that all requirements have been met and these inspectors in the government arsenal are not responsible to the small arms divisions but to a special inspection department. Similar government inspectors are employed in the operating plants and will be employed in the new plants.

Most of the inspectors are women. Much of the inspection is visual but there is considerable gage and machine checking. Descriptions of some specific inspection jobs follow.

Case inspection

After the cases are completed and before the primers are inserted, all are inspected. A machine device which carries the cases from left to right on a screw conveyor with mirrors above and below permits the inspector to check the mouth and head of each case for visible defects. Other inspectors use gages, magnifying glasses, and checking aids. The lighting must be good,

the workers sit, and there are no hazards. Acuteness and dexterity are required for this inspection and a training or learning period of six to eight weeks is needed.

Both defective and approved cases are re-inspected to make certain that defective cases are not accepted and that acceptable cases are not discarded. This worker must be a person of more experience than the original inspector, though the devices and machines used are similar.

Primer inspection

Primers are inspected with the aid of magnifying glasses and the rejected ones are removed with small tweezers. One or two weeks of training to become familiar with the points for which inspection are made is all the training required. The work is exacting in that the individual units handled are very small. Since the primers are inspected in the room where they are made, and since they contain explosives, there are the hazards to which all explosive operators are subjected.

After the primers have been inserted in the cases, there is a special inspection of the insertion, crimping, and varnishing. This work is done near the primer-insertion machine and the worker stands. The cases are greasy so gloves must be worn if the hands are to be protected from the oily film. Only a few days' training is needed.

Completed rounds of ammunition inspection

Women operate an automatic inspection machine which checks the dimensions on six points and also the weight. The function of the operator is merely that of a machine feeder.

The preceding are typical of only a few of the types of inspection done and there are a great many other machine, gage, and visual checks made by women. Women do all the inspection except the drop-primer test, the mercury cracking test, and a few other technical testing jobs. Both the drop-primer test and the mercury cracking test could be done by women. The mercury cracking test is an accelerated chemical aging test to determine the possibility of cracks and splits in storage. A simple chemical routine is followed in making the test and could be done as well by women as by men. Gloves are worn to protect hands from nitric acid and mercurous nitrate. Since this is a random sample or spot-check of a few cases and cartridges of a large lot, the tester must be a careful and responsible person, as the acceptance or rejection of the entire lot may be determined by this test. Since a solution of mercurous-nitrate (1 percent) is used there may be some hazard of mercury poisoning for the careless worker.

PACKING

Women are employed to set up cartons, to pack cartridges into small pasteboard containers and then into the larger cartons, and hand-paste labels on the cartons. Men pack the cartons into metal-lined wooden boxes, solder the covers, and test for leaks. The final packing processes are too heavy for women, as boxes often weigh more than 100 pounds.

MISCELLANEOUS WOMEN'S JOBS

A number of jobs of minor employment significance held by women working in the government arsenal visited were on rifle clips, pressure cylinders, and dummy ammunition.

Rifle clip manufacturing

Women blanked out the parts and springs for rifle clips which hold five rounds of ammunition. The machines were punch presses with automatic feed, each woman operating from two to four machines. One woman fed clips and another springs into an assembly machine which turned out the clips. On another special machine, five cartridges were packed in each clip. One woman fed the clips and the other the rounds of ammunition. These feeding operations were fast but there was no skill or special experience required.

Pressure cylinder manufacturing

A new job for women in the Government arsenal was the making of small pressure cylinders - about one-half inch in length and one-fourth in diameter - and about 20 women were employed in a corner of the tool room on work that had formerly been done by men. The women were operating small bench shearing machines cutting the cylinders, machine burring, and hand lapping the ends. Approximately 5,000 cylinders a day were being turned out by the women and their productive rate has averaged about the same as that of the men who formerly did this work.

Dummy ammunition

A few women were doing various jobs on dummy ammunition, chiefly drilling holes.

UNIFORMS

Though no regulation uniform is required for explosive workers in the Frankford Arsenal, women are urged to purchase two simple cotton uniform-dresses, one red and one blue, colors alternated weekly in an effort to insure the wearing of a freshly washed garment at the beginning of each week. Lightly starched cotton fabric, which is somewhat resistant to fire, is the standard for the approved garments. Clothing made of inflammable cellulose fabric is banned. The approved uniform at the Arsenal is fashioned so that in case it becomes ignited it can be removed quickly. Hair nets as a safety precaution must be worn by all women to keep long hair from becoming entangled in moving parts of machinery, to keep stray locks from being attracted by the static of machinery, and as a protection in case of a sudden flare-up of powder which might ignite loose ends of hair. Cotton work gloves are worn by some of the machine operators and inspectors as a protection against cuts and the grease and oil of the machines and parts handled. All uniforms, gloves, and hair nets are provided and maintained by the workers.

SUPERVISION

The need of adequate supervision in an explosive shop was stressed at the Arsenal. The departments are divided into small units with an immediate supervisor over each. The selection and training of women who can supervise other women is a problem in human relationships which must be studied and met in the new plants. The supervision of small groups on night shifts must not be relaxed but should be given as much or more consideration than that on day shifts.

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U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

EMPLOYMENT OF WOMEN IN THE MANUFACTURE OF ARTILLERY AMMUNITION

189-3

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Based on visits to Frankford Arsenal, Philadelphia and Picatinny Arsenal, Dover, N.J. (per E.E.)

EMPLOYMENT OF WOMEN IN THE MANUFACTURE OF ARTILLERY AMMUNITION

INTRODUCTORY

Ammunition for artillery weapons is all more than one inch in diameter, with the most usual sizes 37-mm., 75-mm., 105-mm., and 155-mm. in diameter. Artillery weapons include guns for harbor defense fortifications, antiaircraft mounts, mobile field weapons, and heavy guns transported on their own wheels or by railroad and automotive carriers. Other types of ammunition are small arms ammunition used in rifles, revolvers, and machine guns, trench mortars, grenades, bombs, and pyrotechnics.

Artillery ammunition is classed as fixed, semifixed, and unfixed according to method of loading the propellant charge. In the fixed and semifixed types the propellant charge is carried in a cartridge case to which the projectile is attached; in the fixed, loose powder is poured into the case; and in the semifixed, bags of varying sizes are assembled in the case. Unfixed ammunition eliminates the case, and instead the powder, contained in bags, is loaded separately in the bore of the gun.

The manufacture of artillery ammunition has been broken down into many separate component parts and assemblies which lend themselves to wide distribution among many contractors. Component parts for artillery ammunition, such as cases, shell forgings, fuzes, primers, and so forth, are being manufactured by contractors and subcontractors spread over the entire country. The parts are brought together for final assembly and loading at government arsenals or shell-loading plants. Large new plants for shell and bag loading are under construction and will soon be in operation in Alabama, Illinois, Indiana, Iowa, Ohio, Tennessee, and Virginia.

Women already are employed in government arsenals and in parts manufacture at many operations, specifically as machine operators, assemblers, inspectors, packers, and so on. The new plants will offer many similar jobs. There will be wide opportunity of further expansion of women's employment in an expanding production, both on new jobs and as substitutes for male operatives if the need arises. Undoubtedly women can carry on well over half of the operations in the manufacture of artillery ammunition.

With the specialization of labor which accompanies mass-production techniques, training periods for almost all the jobs as machine operators, assemblers, and subinspectors are short, usually not more than a month. If women, either through training within industry or through vocational courses, can develop sufficient skill to assist with the setting-up and adjusting of machines, more opportunities of employment and usefulness will be open to them.

The report which follows and the summary of the principal occupations and possibilities of extension of women's employment are based chiefly on observations of processes and operations at two government arsenals which produce artillery ammunition and component parts.

Frankford Arsenal, Phila
Picatinny " Dover N.J.

Summary of the Principal Operations in the Manufacture of Artillery Ammunition and Components and the Possibilities of Extended Use of Women

	Sex of Present Operatives (M - male, F - female)	Extension of Women's Employment
METAL COMPONENTS MANUFACTURING		
Toolmaking, adjusting, setting up machines, etc.	M	Not suitable.
Machine operations	M and F	Proportion could be increased.
Assembly	M and F	Ditto
Inspection	M and F	Ditto
FUZE ASSEMBLY (including detonators, fuze primers, boosters, etc.)		
Machine operations	M and F	Could be used almost entirely.
Assembly	M and F	Ditto
Inspection	M and F	Ditto
Loading	M and F	Ditto
Packing	M and F	Ditto
PROPELLANT PRIMERS		
Body and head machine operations	M and F	Proportion could be increased.
Assembly of body and head	M and F	Ditto
Loading (explosives operators):		
Head	F	-----
Body	M	Could be used entirely.
PROJECTILE MANUFACTURING		
Machine operations	M	Could be substituted in part on lighter projectiles.
Inspection	M	Could do 37-mm.
Painting	M	Ditto
Packing	M	Ditto
CARTRIDGE-CASE MANUFACTURING		
Drawing, annealing, pickling, etc.	M	Not suitable.
Machine operations	M	Could be substituted in part.
Stamping identification	F	-----
Inspection	M and F	Proportion could be increased.
Packing	M and F	No further extension possible.
PROJECTILE LOADING		
Melting, pouring, and compressing explosives	M	Not suitable.
Drilling fuze cavity	M	Ditto
Cleaning threads and miscellaneous light jobs	M	Could be substituted in part.

Summary of the Principal Operations in the Manufacture of Artillery Ammunition and Components and the Possibilities of Extended Use of Women

	Sex of Present Operatives (M - male, F - female)	Extension of Women's Employment
CASE LOADING AND ASSEMBLY		
Inserting primer	M	Could do 37-mm. and 75-mm.
Weighing and pouring powder	M and F	Could be used entirely.
Crimping case to projectile	M	Could do 37-mm.
Miscellaneous machine operations	M	Could be substituted in part.
Painting and stenciling	M and F	Proportion could be increased.
Packing	M and F	No further extension possible.
Inspection	M	Could do 37-mm.
BAG LOADING		
Bag sewing:		
Cutting and trimming	M	Could be used entirely.
Power machine operating	F	-----
Smokeless powder bag loading:		
Weighing and loading	F	-----
Sewing loaded bag	F	-----
Black powder bag loading:		
Weighing and loading	M	Not suitable if hopper must be filled.
Sewing loaded bag	F	-----
Putteeing propellant charges	M	Not suitable.
Inspection	M and F	Proportion could be increased.
Packing	M and F	Ditto
EXPLOSIVES MANUFACTURING		
Smokeless powder	M	Not suitable.
Black powder	M	Ditto
TNT, amatol, etc.	M	Ditto
Black powder pellets	M	Could be used entirely.
Tetryl pellets	M	Ditto

METAL COMPONENTS

In the manufacture of artillery ammunition, a considerable number of metal components are required in addition to the case, projectile, and explosive mixtures. Fuzes, primers, boosters, and other separate units must be provided and the structural parts of these are metal. Detailed and standardized specifications have been established by the ordnance divisions for most of the metal components used, and this has made possible the distribution of contracts among great numbers of manufacturers throughout the States and allows mass-production techniques to be developed for many separate parts. Fuze parts such as bodies, cases, adapter rings and plugs, springs, firing pins, caps, tubes, rings, and time units may all be made in separate plants. Primers and boosters similarly are farmed out. The manufacture of most metal components for ammunition is a fabricated metal type of production. The workers are machinists, machine operators, bench and assembly operatives, and inspectors, and are rarely concerned with the handling of explosives.

Since the components are to a large extent small and the processes broken down into many operations, women are employed extensively, and if expansion continues in the ammunition industry increasing numbers of women will be used. In almost every machine shop a small nucleus of tool makers and machinists is required for making tools, machining complicated parts, and setting up the automatic precision machines. The bulk of the workers, however, are machine operators, bench workers, and inspectors, and women could constitute two-thirds to three-fourths of the operatives. Recent

labor needs estimated for three firms making artillery metal components show more than 60 percent of the force women, and one company states that as production increases probably 75 to 80 percent will be women.

At the present time assembly and inspection are the occupational footholds of the women operatives. Women in relatively small proportions are operating drill presses - drilling, tapping, reaming, and countersinking - milling machines, polishing and lapping pivots and small parts, burring machines, and special small bench machines such as the Derbyshire lathes and micro-milling machines. Their employment as machine operators could be greatly extended.

FUZE ASSEMBLY

Women are exceedingly important in the labor pattern for the manufacture of fuzes. Modern ammunition fuzes are intricate structures of a wide variety of designs varying with the shells and targets concerned. The following definition of a fuze is given in Elements of Ordnance: "A fuze is a mechanism for igniting or detonating the bursting charge of a projectile, and performs this function either upon impact or at a certain time during flight. When designed to function on impact it is classed as an impact or percussion fuze, and when designed to function at some predetermined time after the projectile leaves the gun it is classed as a time fuze. A combination fuze combines both time and percussion elements." 1/ Depending on the action which the fuze is to set off, it is classed further as delay, nondelay, superquick, and supersensitive. Time fuzes are used when the shell is required to explode after the lapse of a predetermined interval of

1/ Lt. Col. Thomas J. Hayes, Elements of Ordnance, p. 579.

time, and the timing elements are controlled by the burning of a powder train, or liquids within the fuze, or by a mechanical timing mechanism which is similar to that of an alarm clock except that instead of releasing a vibrating bell it fires a primer.

Mechanical time fuze.

All the parts of a mechanical time fuze are small and the time units are similar to those of a fine clock or watch. Before the present defense emergency, mechanical time fuze assembly employed men almost exclusively, but in a relatively short time the proportions have been reversed. Three years ago one of the government arsenals had 98 percent men and 2 percent women in its mechanical time fuze department, and now it has 96 percent women and 4 percent men. More fuzes are being produced per employee than ever before. The employment of women and the great increase in production per operative has been brought about by a complete change in the breakdown of operations and the introduction of large-scale production techniques. Men were employed more extensively at first after the operations had been revamped, but women were found to be much better adapted to handling the small parts and more able to concentrate continuously on fine work which requires finger dexterity and patience.

A mechanical time fuze is made up of more than 100 parts. At the arsenal almost one-half of the parts were made within the plant, the others being supplied by outside contractors.

Many of the small parts, varying in size from a fraction of an inch to several inches, are machined on automatic screw machines. The set-up and adjustment of the machines require skilled mechanics, and usually the set-up man and an assistant, often an apprentice, tend two

or more machines feeding raw stock and checking the machining. Few women are skilled mechanics and unless men are employed exclusively for set-up there is not much possibility of employing women. In very large shops with a set-up crew women might operate the smaller machines where the raw bar stock is light.

Much of the punch-press work blanking out discs and small plates in the machine shop is done, and more can be done, by women. Where the punch-press work involves the handling of heavy raw stock and moving hoppers or trucks, the job is too heavy for the average woman.

The fuze body, base, disc, and other parts are reamed, drilled, and tapped, sometimes on multiple drills in jigs and sometimes with sensitive drills. Women are doing much of this work and can do it all.

Small lathes, micro-milling machines, gear hobbers, and routing machines - all diminutive bench varieties - are being operated by women successfully. Tolerances on some of these are as fine as two-one-hundredths of a millimeter.

Grinding on automatic grinders, wire wheel burring, machine lapping, and polishing are other jobs of women. Grinding surfaces should be shielded even on small machines. Gloves and goggles as protection against small flying particles are needed, though the need may be less than on larger machines.

Subassembly of small parts employs women almost exclusively. Presses operated by women assemble springs, weights, and counterweights for fuze movements. All the subassembly work is concerned with tiny parts; small hand bench tools and arbor presses are used.

The assembly of the movement is divided into progressive steps similar to those of building up a watch or small clock. Much of the work is intricate; small tools - tweezers, files, screw drivers, hand drills, and others - are used and some of the assemblers wear a jeweler's loop (eyeglass) in their work. Some of the operations are the inserting of wheels and movement parts; screwing, staking, and peening subassemblies in place; and setting escapements, firing pins, firing arms, and testing their action. When the movement is assembled it is fitted into the fuze case.

Men operatives in the arsenal fuze division are unimportant in number and in the assembly operations are doing such work as adjusting tensions, straightening springs, and adjusting escapement wheels. Some of these jobs require operatives with considerable fuze-making experience and are held by men who have been employed for years in this work. Men are employed on high-speed staking machines, spot drills, and spinning machines. These might be operated by women. Some of the machines are to be replaced by newer automatic machines and women will be used as operators.

Bench jobs such as hand burring, polishing, cleaning parts, and disassembling fuzes that have been rejected are simpler miscellaneous jobs that are done by women.

Inspection

With the fine tolerances prescribed, inspection is constant and tied up with the operations. Women do most of the inspection in the fuze department. Besides the more common gage, visual, and scale checking, women inspect and adjust hair springs on strobo-globe machines, and project fuze

parts on comparators or shadowgraphs. Fuze movements are given a final test by women on dynamic regulators which spin the timing mechanism at the projection speed of the gun with the action recorded on an oscillograph. Electro-limit gages which require ability to read blue prints all are being operated by men, but women able to interpret blue prints could do this.

Loading primers for mechanical time fuzes.

The machining and assembly of a mechanical time fuze does not involve the handling of any ammunition. The firing pin of the fuze touches off the primer, which is screwed as a separate assembly in the base of the fuze. The loading and assembly of primers for mechanical time fuzes is carried on in a separate department in which only a small proportion of the total workers - less than 2 percent - are employed. Most of the work is done by women in the government arsenal visited. Women insert the charged primer element, peen the element in place, tie down the main powder charge which is contained in a small bag, peen the closing screw after it has been inserted and tightened, and shellac the closing screw as a final operation. Men insert and tighten the closing screw.

Fuzes other than mechanical time fuzes

Percussion fuzes and powder-train time fuzes of numerous models have fewer parts and a less complicated structure than the mechanical time fuze. Metal component parts are made and assembled in a series of simple operations, almost all of the kinds for which women are especially suitable. In these, fuzes and allied parts such as detonators and boosters, elements embodying small quantities of explosives which are part of the powder train, are handled. On many jobs there is an ever present explosive hazard and only the emotionally stable should be employed.

As illustrative of the occupations of women on complex percussion fuzes, a list of the 38 operations performed by women and men on one of the more complicated "delay-action" types of point detonating fuze is given here.

Operation	Sex of Operative (M - male, F - female)	Occupation
1 - Examine fuze head	F	Inspect
2 - Insert detonator, detonator cushion, and retaining screw	F	Assemble
3 - Stake retaining screw in head	F	Machine operator
4 - Gage primer cover with micrometer	F	Inspect
5 - Insert relay cup assembly into plunger body	F	Assemble (ex. op.*)
6 - Insert delay holder assembly into plunger body	F	Ditto
7 - Insert delay element washer into plunger body	F	Ditto
8 - Insert primer assembly into plunger body	F	Ditto
9 - Insert primer cover and plug into plunger body	F	Assemble
10 - Screw plug into body	F	Ditto
11 - Stake plug in plunger body	F	Machine operator
12 - Assemble firing pin, spring, and retainer in plunger body	F	Assemble
13 - Assemble components on delay firing assembly fixture	F	Ditto
14 - Complete delay plunger assembly	F	Ditto
15 - Assemble centrifugal plunger pin lock	F	Ditto
16 - Drill hole, insert, and crimp firing pin into body	M	Machine operator
17 - Test delay plunger assembly for arming and nonarming	F	Inspect
18 - Test body assembly for arming and nonarming of interrupter	F	Ditto
19 - Stamp data on fuze body	F	Machine operator
20 - Assemble ogive and head assembly to body	F	Assemble
21 - Tighten head assembly to body	M	Machine operator
22 - Stake ogive to head assembly	F	Ditto
23 - Complete fuze assembly	F	Assemble
24 - Tension bottom closing screw assembly to body	M	Machine operator
25 - Stake bottom closing screw assembly to body	F	Ditto
26 - Gage fuze	F	Inspect
27 - Remove booster from box	F	General labor
28 - Assemble booster to fuze	F	Assemble
29 - Drill lock screw hole in fuze	F	Machine operator
30 - Insert lock screw	M	Assemble
31 - Stake lock screw and fuze	F	Machine operator
32 - Gage and inspect assembly	F	Inspect
33 - Insert assembly in fiber container	M	Pack
34 - Assemble sealing strip	M	Ditto
35 - Secure label to fiber container	F	Ditto
36 - Stamp data on end of fiber container	F	Ditto
37 - Stencil data on packing box	M	Ditto
38 - Pack container in packing box	M	Ditto

* Explosives operator

Operatives who insert relay, delay, and primer elements are classed as explosives operators. While the other operations do not involve the direct handling of the explosive elements, the women are handling loaded parts and safety standards and precautions must be rigorously maintained.

About four-fifths of the steps in the listed fuze-making operations are performed by women, and practically all might be except for the assistance of men in lifting and moving supplies and packed containers.

Booster and detonator assemblies

The booster is the explosive element in the explosive train between the detonators of the fuzes and the bursting charges in the projectiles. Sometimes it is contained in a light metal casing or cup. Women prepare the booster cups for loading, inserting felt and paper discs. Tetryl, a high and sensitive explosive, is used in loading the booster cups. It has a toxic hazard (dermatitis) and operatives handling it in government arsenals are paid an additional rate and given an extra time allowance for bathing at the end of the workday. Booster cups in a government arsenal are loaded by men and the final closing and crimping also is done by men. Women might do this work.

Fuze primers and detonators of various kinds (relay and delay) are other small subassemblies for the fuzes which are put together separately. Like the booster cups, there are light jobs placing cups on trays, separating and inserting tiny discs of paper and metal, and loading the cups with high explosives. Lead azide, fulminate of mercury, and tetryl pellets are the high explosives used. Women weigh, check-weigh, and inspect charges of lead azide and mercury fulminate and insert tetryl pellets. Shields of safety

glass and barricades of lead between the operator and the work are used as much as is feasible. Loading and crimping the detonator in loading presses and ejecting the detonators from the sleeves or jigs used as fixtures in the loading processes usually are done by men. These are the jobs on which the explosive hazard is the greatest. There is no physical strain involved and women might operate these machines. The final inspection, packing, and labeling are done by women.

All the operations for the making of fuze boosters, detonators, and primers can be done by women. There is no reason to suppose that women are less careful and less responsible than men as explosives handlers. In the handling of tetryl in any form women should have the same bonus rate (toxic) and bathing facilities as provided for men.

Training for mechanical time fuze manufacture

The work has been so subdivided and simplified that the training period is short. At the government arsenal, a 30-day period was deemed sufficient for any single machine operation or assembly job. There was, however, an apprentice training program for women fuze makers which covers a year's period. About 200 women were enrolled and they transfer from one operation to another until they have been developed into all-round operatives. From this group supervisors are to be selected, not only for the arsenal but to serve as instructors and ordnance inspectors in private corporations manufacturing time fuzes.

PROPELLANT PRIMERS

Propellant primers are another component assembly which is made by dispersed contractors. They differ somewhat in models and construction according to the guns and uses for which they are made. The primer body is a metal tube which serves as a container for a black powder charge. The firing mechanism strikes the anvil in the base of the primer, igniting a highly explosive percussion composition or pellet which starts the firing by ejecting a flame through a vent hold into the black powder charge contained in the primer; this in turn ejects flames through flash or vent holes in the wall or through the mouth of the tube, which sets off the larger charge of propellant powder in the case or bore of the gun which sends the projectile on its course.

Primer bodies usually are made on automatic machines which cut the stock, drill, tap, insert, and crimp a plug in a series of operations. Such machines require skilled adjusters or set-up men, and the feeding of raw stock is heavy work, so these are not suitable for women. Flash holes in the wall of primers are cut or drilled in several ways. High-speed specialized multiple drills for primers perform this operation in the manner of automatic machines and require competent mechanics for set-up. Older, slower machines to which primers are fed one at a time can be operated by women. On small short primers flash holes are punched on a crank press and women might do this. On all the preceding operations in the government arsenals visited, men were employed though some might employ women.

The inside of the primer body is machined on reaming and burring machines with high-speed spindles. After the machining the chips are blown out with compressed air. The machine has a fixed set-up and is simple in operation. Women seated, wearing goggles and gloves as protection against the flying chips, tend this type of machine.

Primer heads, cups, and anvils are small parts and women can be employed on the drawing, blanking, and machine operations concerned in their manufacture.

Loading of primer heads

The loading of primer heads is another woman-employing occupation. The primer element, including the primer cup, anvil, foiling disc, and primer composition, are component assemblies which are the products of commercial explosives producers. In the propellant primer department of a government arsenal, one group of women is operating light staking machines which stake the primer element into the primer head and another group on similar machines assembles the firing plug and primer head. Others are hand screwing firing plugs into the cups and packing the cups into wooden boxes. All the work on the loading of primer heads is light and suitable for women. Explosives in small quantities are contained in the element but the possibility of accidental detonation is slight.

Loading of primer bodies

The loading of primer bodies is a powder-loading plant process. Primer bodies are given protective coatings of special paint by a machine dipping process which could be done by women though none are used. Excess

paint is removed by hand cleaning with varsol, which can be done by women if gloves are worn or hands coated with special hand creams which are protective against the drying effect of substances such as this cleaner. Women are employed to line the primer tubes with paper and to waterproof the mouth end with shellac and wax. The primer charge, black powder, is weighed and poured into the body. The primer head is screwed and crimped to the body by special machines. These workers are classed as explosives operators and only men were found working at the loading operations. The work is not heavy and can be done by women if the criterion of employment for explosives workers is not based on sex. If proper work-clothing standards and all precautions possible are taken, the hazard of and for women workers is no greater than for men. The packing of primers into shipping or storage containers and the taping of containers are done by women.

PROJECTILE MANUFACTURING

A projectile is the missile fired from the gun. Usually it is made of forged steel. Basic types of projectiles classified according to "tactical use" are shell, shrapnel, and canister; since shells are the most important, the terms projectile and shell are often used interchangeably.

The methods of manufacturing projectiles vary with the size and type of projectile being made and the equipment and tooling set-up of the manufacturer. Much new equipment has been perfected for projectile manufacturing in the last few years, and where formerly 32 or 35 separate operations were performed on one projectile only 10 or 12 now are necessary.

Machines with "multi-tool" set-ups now perform many operations formerly done on separate machines, with a corresponding reduction in numbers employed and an increased need of set-up men. At the arsenal visited, projectiles of 37-mm., 75-mm., 90-mm., 155-mm., and 3 inches are produced. On the whole there are not great numbers employed in the projectile division as compared with other sections in the arsenal. No women are used on any basic operations but a few are employed blanking out base covers. Even in a great emergency women could be employed to only a limited extent because so much of the work is heavy, so many of the machines require skilled operators, and the working conditions in general are undesirable.

There is wide-spread use of roller-type conveyors that move the projectiles from one machine to another, but even so, many of the machine operations require continual handling of projectiles and feeding them into machines, which results in accumulated fatigue for most women. Women could perform some of the operations on the 37-mm. and 75-mm. projectiles, the latter weighing about 11 pounds.

For purposes of analysis the manufacturing sequence for 75-mm. high explosive shells has been selected as typical. The general operations on either smaller or larger projectiles would be quite similar in spite of some variation in sequence and individual machine operations. 2/

2/ The general sequence followed is based on production of 3000 75-mm. shells per 8-hour day at Frankford Arsenal. (Steel, March 31, 1941, Machining High-Explosive Shell, pp. 54-58.)

Sequence of Operations on 75-mm. Shells

1 - Shotblast
2 - Center
3 - Cut off, rough turn, and face base
4 - Cold nose (tapering)
5 - Finish turn
6 - Drill and tap set-screw hole
7 - Finish both ends and band seat
8 - Notch
9 - Stamp
10 - Knurl band seat (machining operation)
11 - Apply rotating band
12 - Turn band
13 - Weld base cover
14 - Degrease
15 - Final inspection
16 - Insert set-screw and grease threads
17 - Spray painting
18 - Packing

Finish-forged cavity shells are received from outside forge shops ready for machining operations. First the shells are shotblasted on an automatic shotblast machine. The base end is then centered on either a lathe or a drill press to insure concentricity for all succeeding operations. A new automatic multi-tool lathe has been developed for cutting off the discard metal at the base, for rough-turning the head and body, and facing the base. The open end of 75-mm. shells can be tapered on a crank press without heat treating, but all shells over 90-mm. must be heated before nosing or tapering. The exterior surface of the projectile is then finish-turned on a lathe, and the set-screw hole is drilled and tapped on a drill press. Both ends of the shell and the band seat are finished in a series of boring, reaming, and facing operations on a multi-spindle machine. The employment of women on any of the first seven operations is of doubtful feasibility. In the first place much of the work is heavy, and second the specialized automatic machines used require frequent attention from set-up men who have all-round mechanical skills and years of machining experience.

The eighth operation is notching the nose on a hand-feed indexing or milling machine with automatic stops. Stamping the base with the year of manufacture, size and type of shell, and manufacturer's initials is done on a press. Knurling (machining operation) the longitudinal grooves for placing the rotating band is done on a machine with two knurling rollers. All three operations of notching, stamping, and knurling are highly repetitive and require little skill and could be done by women on 37-mm. and 75-mm. shells.

A rotating band on a projectile is a means of setting the shell into rotating motion and keeping it in straight lateral flight, the band being a trifle larger than the bore of the gun. The setting of the rotating band is done on a hydraulic press (tire setter), the shells and the bands being fed into the machine by hand one at a time prior to each pressing operation. The band is then turned on a semiautomatic lathe, and the operation merely involves loading the machine. On the 37-mm. and 75-mm., women could both apply and turn the rotating band.

Some women are operating punch presses blanking out discs to be used as base covers on the ends of projectiles. A seam electric welder is used in welding these covers to the base, the machine being automatically set for the welding time needed. Women could do this welding on shells of 75-mm. or less.

The shells are degreased by washing in a trichloroethylene solution and this work involves moving and loading heavy racks, which would be too strenuous for women.

All shells are inspected visually, by gage, and by electro-limit gages that check six dimensions at one time. This inspection involves handling several thousand shells in one day, which makes inspection by women too strenuous on all shells but the 37-mm. Women could do all the inspection on the 37-mm. projectiles; they could also insert the set-screw and grease the threads on 37-mm. and 75-mm. shells.

The shell cavities on most of the projectiles are hand spray-painted, while the exteriors are automatically spray-painted under a hood with the shells moving on a conveyor being loaded and unloaded by an operative. If manufacturing were done on a quantity-production basis sufficient to warrant specialization among the workers in the spray-painting section, women could be used for painting the 37-mm. shells, but even this would not involve any great number of employees.

Packing of shells into cartons and cases and sealing the cases involves manual tasks too heavy for women, except for the 37-mm. projectiles.

Women could do more of the operations on the 37-mm. shell than on any other size because of its comparative lightness in weight. These shells are not forged but are cut and turned from bar stock on large automatic screw machines which are tended by skilled machine operators who can change the set-ups. Women could not operate this machine, but as already indicated they could operate a number of the other machines provided there were adjusters and set-up men.

CARTRIDGE-CASE MANUFACTURING

The manufacture of artillery cartridge cases does not involve the extensive use of mass-production methods found in the making of small arms ammunition, and the variety of cases manufactured makes the production more or less on a job-shop basis. 3/

Drawing

Raw stock is purchased in the form of brass discs for all but the 37-mm. cases, which are bought in cup form ready for succeeding drawing operations. There are four draws on 75-mm. cases, including the initial cupping, and each draw elongates the case and reduces the wall thickness. The cups are hand fed into dials and drawn on large hydraulic presses. The shop superintendent felt that this would not be a desirable place in which to employ women because the working conditions are not favorable, the shop being hot and very noisy, the floors wet and slippery from the spattering of coolants and from the pickling, annealing, and washing operations, and because the continual and rapid feeding of cases into dials would make the work too strenuous.

Annealing, pickling, and washing

Annealing, pickling, and washing operations are performed after each draw, prior to tapering, and after the final mouth trim. The annealing is a heat-tempering operation to remove the residual strains in the metal after

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3/ Operations in making 75-mm. cartridge cases follow the general order presented below based on the production of 3,750 cases in an 8-hour day. (Army Ordnance, January-February 1940, Cartridge Case Manufacture, p. 240.) The operations on either larger or smaller cases would be somewhat similar.

the various drawing and machining operations. All the work in this connection is too stremuous for women because it involves moving heavy trucks and racks filled with cases. The work is very hot also and the floors are wet and slippery.

Trimming

The open end of the case is trimmed at two different times, once after the third draw and again after the machining of the head and primer hole. The first trim is made on an automatic trimming machine, the function of the operator being to feed the cases into a magazine which holds the cases being fed gradually into a rotary cutter. Men are doing all this work but it is a simple repetitive job which women could do on the lighter cases such as the 37-mm. and 75-mm. On the final trim the cases are cut to exact dimensions on a two-spindle drill press into which the cases are fed one at a time, and women could do the final trimming on the 37-mm. and 75-mm.

Heading and indenting the base

A crescent-shaped thickness of metal is left on the base of the case during the various drawing operations. After the first trim this base is flattened on a hydraulic press to form a flange for seating the round in the gun and for extracting the fired case from the bore, and on the same machine an indentation for the primer socket is formed. This is more of a skilled operation than trimming and requires approximately three months to learn. The operators must be able to read blue prints. Men are now engaged as operators, but with proper training women could do this work on 37-mm. and 75-mm. cases.

Tapering

After the heading operation, the upper part of the case is annealed preparatory to a full-length taper on a dial-feed press. Men are doing all the tapering, but with extra set-up men and with about a week's training women could do the tapering on 37-mm. and 75-mm. cases. A small group of women are putting a slight bevel on the mouth end of the cases prior to tapering, by hand hammering the end of the cases over a die block. At the time of visit they were doing this on 37-mm. cases.

Machining head and primer hole

The head and primer hole are machined on a multi-spindle machine after tapering. The primer hole is bored, counterbored, and reamed, and the head is turned and faced to required dimensions. There is another type of machine that not only finishes the base but also does the final mouth trimming, and the primer hole has to be drilled prior to going into this machine. These machine operations are the most skilled in cartridge-case manufacturing and they require workers who have sufficient skill to adjust the machines frequently. Women can hardly be expected to acquire such skill and experience in an emergency program.

Stamping

Women are operating dial-feed presses stamping a series of coded letters and numbers on the head of the cartridge case for identification purposes. Women are doing all the stamping, which is a relatively simple operation.

Inserting screw eyes

A small group of women are putting screw eyes in the bottom of 75-mm. cases for tying in powder bags. Some are threading the holes with hand tools and others are screwing in eyes. This is an operation performed only on semi-fixed ammunition.

Inspection

Throughout the various stages of manufacture the machine operators spotcheck their own work visually and with micrometers, and periodic laboratory tests are made of the grain structure of the cases. In the final visual, gage, and machine inspection both men and women are employed. Women are using gages and operating gaging machines which check nine dimensions simultaneously. Men are doing the same types of inspection but on the larger cases. The largest cases women ever handle are the 5.38-caliber, which weigh 12.3 pounds.

Packing

Both men and women are packing cartridge cases into cardboard boxes, the men generally doing the heavier tasks. After packing, the cases are shipped to shell-loading or ammunition-loading plants to be filled with propellant powder and joined with the projectile.

AMMUNITION LOADING AND ASSEMBLY

The projectiles, cartridge cases, primers, and other component parts are sent from their respective manufacturers to some ammunition- or shell-loading plant where the assemblies are completed, the projectiles are filled with explosive charges, and the cases are filled with propellant powder and joined with the projectile to make a complete round of ammunition except for the fuze. The fuze usually is not screwed into the nose of the projectile until the ammunition is to be fired. Five new ammunition (shell) loading plants are now under construction in Ohio, Indiana, Illinois, Iowa, and Tennessee.

Projectile loading

Projectiles are loaded with a main explosive charge which may be a high explosive, low explosive, or chemical agent. Low explosive charges (black powder) are used in some service shells, practice shells, and shrapnel. Some of the principal high explosives used are trinitrotoluene (TNT), amatol, ammonimum picrate, and tridite.

When the shells are received at the loading plant they are unpacked, the nose plug is removed, and the shells are cleaned to remove grease and dirt. Women could do the unpacking, cleaning, and removing of the nose plug on shells lighter than 75-mm.

TNT and tridite are loaded by melting the explosive and pouring it into the shell cavity; ammonium picrate is loaded in increments and then compressed by a hydraulic press; amatol is either melt-loaded or

compressed depending on the proportion of TNT and ammonium nitrate. A fuze cavity is drilled into the explosive charge after the shell is loaded and only men are employed for this, as they are for the loading operations. The men working in shell loading are used interchangeably on a variety of operations and women could not very well be employed in any of this work. The actual loading of the shell requires an extended period of training; the work is dangerous and there are a number of manual tasks involved.

After the fuze cavity has been drilled, the grains of powder accumulated on threads of the projectile must be cleaned off and women could do this on the lighter shells. Men are doing all the cleaning of threads at the arsenal. The opportunities for employment of women in shell loading are very limited because of the weight of loaded projectiles, all but the 37-mm. weighing considerably more than 10 pounds.

Case loading and assembly

After the shells are loaded with the main bursting charge they are sent to an assembly line for fitting into a case filled with propellant powder. The loading and assembly involves principally the inserting of the propellant primer, weighing and pouring propellant powder into cases, fitting and crimping the projectile into the case, inspecting, painting, stenciling of shells, cartons, and containers, and packing. All these operations are quite simple, taking only a week or two to learn, and the extended use of women in this work is chiefly contingent on the amount of lifting and moving of heavy parts that might be involved.

Men are doing all the assembling of propellant primers into cartridge cases but women could do this on 37-mm. and 75-mm. cases. Prior to the loading of smokeless powder it must be carefully weighed and check-weighed. Women are doing this for 37-mm. and 75-mm. cases, and they could just as well do the weighing of powder for all other sizes. Women are also pouring the powder into 37-mm. and 75-mm. cases and they could fill the larger ones if arrangements were made so that they would not have to do heavy lifting.

The assembly of different-sized projectiles involves various drilling, screwing, staking, and crimping operations now being done by men, but which could be done by women if the parts to be worked on were not too heavy. Men are crimping the cases to projectiles, a task which women could do on 37-mm. ammunition, but on the larger assemblies the strain of continuously handling missiles weighing 30 pounds and more is too great for women.

Women are brush painting 37-mm. projectiles and are packing 37-mm. rounds into tubes. The extent to which women could be used to paint and stencil larger projectiles, cartons, containers, and so forth depends more or less on the use of move-men or mechanical handling equipment for lifting and moving the heavier materials. Men are paraffin-dipping some of the 37-mm. ammunition as well as the tubes into which the 37-mm. are packed, and women could do this. All the visual and gage inspection of completed rounds is being done by men, and women could do this on 37-mm. Women can pack the 37-mm. but the packing of all larger ammunition involves too much heavy lifting.

Bag loading

Bag loading is for "unfixed" and "semifixed" ammunition. In fixed ammunition the shell and propellant are joined in one assembly for the 37-mm., 75-mm., and 105-mm. artillery ammunition, and sometimes for larger ammunition. For guns and cannons of larger bore, the propellant charge usually is packed in bags and loaded separately. Bag loading is one of the ordnance divisions that are accepted employment fields for women.

New commercial army ordnance plants for bag loading are under construction in Virginia, Indiana, and Alabama and will soon be in operation. One of the government arsenals carries on experimental work, sets standards, and does production loading of powder bags. All the new plants will employ women extensively; at least one-third of their operatives are to be women.

The cutting, trimming, and sewing of powder bags is needle-trades manufacturing. Cloth for the bags is laid by machine spreaders, and a few cutters - in the government arsenal men - cut the material into the various sizes and shapes required, depending on the powder with which they are to be filled and the type of gun in which they are to be loaded. After cutting, the bags are sent to the print shop to have the designation identifying the charge imprinted. Women operators seam the bags on power sewing machines, leaving an opening for the powder loading. The sewing room is entirely apart from the loading and has no special hazards.

Two types of powder are handled in the loading of bags, smokeless and black, the latter being the more hazardous.

The loading units for smokeless powder in the government arsenal visited are composed of groups of five women working in small enclosed rooms or compartments. While smokeless powder is not especially hazardous,

safety precautions allow a maximum of 30 pounds of powder and 6 persons as occupants of the loading room. The first operation is the tending of a volumetric weighing machine that measures out a specified quantity of powder; the second is checking the weight of the powder, adding a few grains; the third is an additional rechecking of weight; the fourth is pouring the powder into the bag; and the fifth is closing the bag on a sewing machine equipped with a bronze needle and other safety provisions, to reduce the static from moving parts, and placing the bag in a transfer chute. The women on the loading line rotate on the five operations.

Black powder is used in smaller proportions as an igniter, along with the smokeless powder; it is loaded in separate bags. Since black powder is more explosive than smokeless, the loading is done in small cell-like rooms in which are permitted only two operatives and seven pounds of powder at any one time. Men are employed for loading black powder - weighing and pouring the powder into the bags. They not only load the bag but attend to the filling of the supply hopper; the latter is considered too heavy for women. A woman in an adjoining room takes the loaded bag from the transfer chute, stitches the opening on a sewing machine, and passes the bag on to the packing room through transfer chutes. Fewer women are employed loading black powder than smokeless, and since it is more hazardous the operators work in single compartments.

After the bags have been inspected, specified combinations of smokeless and black powder bags are tied together into charges. Some of the assembled bags are putteed on a machine which wraps the bags with strips of cloth into a solid cylindrical core. Putteeing the bags is a machine operation, but as the assembled bags average more than 25 pounds and the

operators handle about 1,000 bags in an 8-hour shift the work is too heavy for women. The covering and packing of the putteed bags is done by men and again is too heavy for women.

MANUFACTURE OF EXPLOSIVES

Practically all the jobs in the manufacture of explosives such as smokeless powder, black powder, TNT, and so forth entails heavy work tending large machines and moving and lifting heavy supplies; most operatives stand all day; and on many jobs there is an explosive or fire hazard. Women are not employed on these processes and it does not seem that there are many suitable or desirable jobs. Women might do some of the lighter jobs such as making explosive pellets.

Black powder pellet and tetryl pellet manufacturing

Pellet making in a government arsenal is done on machines similar to those used in drug factories for making medicine tablets. Only men are reported as employed in making black powder pellets, four presses being operated by each man. The operator loads the press with powder and adjusts and takes away the pellets when the machine is idle, not being allowed in the room while the press operates. There are lever controls outside heavy armor-plate walls and the machine operation is watched through a small window of heavy glass. Black powder is quite dangerous and treacherous and care must be taken in handling it to avoid explosion. However, from the standpoint of lightness of tasks involved in pellet making, women could do the work.

Tetryl is a standard booster explosive and the most powerful of the military high explosives, being very sensitive to shock. Small barrel-churns are used for blending graphite with tetryl. This is a very dusty job, necessitating the wearing of a respirator; the yellow tetryl discolors the skin, hair, and clothing and there is a dermatitis hazard in some cases. The pellets are formed in much the same way as black powder pellets except that one operator tends fewer machines.

The density of the pellets is checked on a mercury displacement scale, which is a light weighing job that women might do. All the work of tetryl pellet making is light enough for women but there are the disadvantages of discoloration and the hazard of dermatitis. Shop foremen at an arsenal were of the opinion that women were more susceptible than men to dermatitis.

Loading tetryl pellets

Several men are filling bakelite tubes with tetryl pellets. Men screw the tops down and two women clean and paint the tubes. Since they handle tetryl directly men are classified as toxic workers, receiving a higher rate, milk, and bathing-time allowance.

Plants making instruments included in Women's Bureau report:

Bendix Aviation Corporation -
Mr. Kenneth McGrath, Factory Manager, Bendix, New Jersey

Mr. Otto Dramse, Factory Manager, Philadelphia, Pa.

Bendix Marine Corporation - 745 Lexington Avenue, Brooklyn, N. Y.
Mr. McNulty, Personnel
Mr. H. Edward, Superintendent of machine shop

Kollsman Instrument Company - 80-08 45th Avenue, Elmhurst, N. Y.
Mr. Paul S. Knowles - assistant to the president

Sperry Gyroscope - 40 Flatbush Avenue, Brooklyn, New York
Mr. David Click, Personnel Director
Mr. Tom Morgan, president

Frankford Arsenal - Frankford, Philadelphia, Pennsylvania
Brig. Gen. Walter P. Boatwright
Mr. L. W. Boody, Chief Clerk
Miss Fenstermacher, Chief of Frankford Civil Service

Bausch and Lomb Company - 635 St. Paul, Rochester, N. Y.
Major A. J. Zimmerman, Public Relations Department
Mrs. Mary Little and Mr. Welch - personnel department

Wollensack Optical Company - 850 Hudson Street, Rochester, N. Y.
Mr. Edward A. Springer, Factory manager

Bell and Howell Company - 1801 West Larchmont Street, Chicago, Ill.
Mr. H. G. Eisler, Personnel manager
Mr. L. L. Mellor, Research engineer

Eastman Kodak Company - Camera Works, Rochester, New York
Mr. M. J. Hayes, Factory manager

Taylor Instrument Company - 95 Ames Street, Rochester, N. Y.
Mr. William F. Johnson, Personnel manager

Rochester Products Company - 1000 Lexington, Rochester, N. Y.
Mr. Thomas L. Lee, General Manager
Mr. Benj. O. Snyder, Personnel Manager

Minneapolis Honeywell Regulator Company - Fourth Ave. & 26th St., Minneapolis, Minn.
Mr. I. K. Foster, Superintendent

S. S. White Dental Company - Prince Bay, Staten Island, New York
Mr. Alfred J. Cawes, Superintendent
Mr. Sam Ryan, Personnel manager

Ritter Dental Company - Ritter Park, Rochester, N. Y.
Mr. H. C. Brownlee, Personnel Director

S. Sklar Manufacturing Company - 39-04 Woodside Ave., Long Island, N. Y.
Mr. James C. Whelen, Superintendent

Fred Haslam Company - 83 Pulaski, Brooklyn, N. Y.
Mr. L. T. Wittner - Manager

The preceding were the firms included in the survey and would suggest a brief thank you note for their cooperation be included with the report. ER

Other plants making instruments not included in Women's Bureau report:

Mergenthaler Linotype Co., Brooklyn, N. Y.

Julien P. Fries and Sons, Inc., Baltimore, Maryland

Breese Corporations, Inc., Newark, N. J.

General Motors Corp., Delco Appliance Division, Rochester, N. Y.

Weston Electrical Instrument Corp., Newark, N. J.

Gilbert and Barker Manufacturing Co., Springfield, Mass.

Barnard Aviation Equipment Co., Inc., Ashley, Pa.

Manning, Maxwell and Moore, Inc., Bridgeport, Conn.

U. S. Gauge Co., Sellerville, Pa.

Spenter Lens Co., Buffalo, N. Y.

Keuffel and Esser Co., Hoboken, N. J.

General Electric Co., West Lynn, Mass.

General Electric Co., Schenectady, N. Y.

Westinghouse Electric Manufacturing Co., Pittsburg, Pa.

Becton, Dickinson & Co., Rutherford, N. J.

Pecorella Mfg. Co., Brooklyn, N. Y.

Bard-Parker Co., Danbury, Conn.

Stewart-Warner Corp., Chicago, Illinois

Leeds and Northrup Co., Philadelphia, Pa., 4901 Stenton Avenue

Pacific Airmotive Division, Airplane Mfg. & Supply Corp., Burbank, Calif.

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THE EMPLOYMENT OF AND DEMAND FOR WOMEN WORKERS IN THE MANUFACTURE OF INSTRUMENTS— AIRCRAFT, OPTICAL AND FIRE-CONTROL, AND SURGICAL AND DENTAL

INTRODUCTION

The manufacture of aircraft, fire-control, and surgical and dental instruments is important in defense production. Manufacturers of these instruments have expanded their plants and organizations; new plants have been opened; and contracts and subcontracts have been awarded to plants whose machinery and organization are of a kind adaptable to small metal and instrument manufacture.

Aircraft instruments for indicating, measuring, recording, or controlling the flight and navigation of an airplane are a vital link in the aircraft industry even though their manufacture is not so spectacular as that of the engines and planes. The same is true of fire-control instruments, which are predominantly optical instruments such as panoramic sights, gun sights, periscopes, telescopes, and binoculars used for controlling the aiming and firing of guns, torpedoes, and bombs. Many of the fire-control instruments are of a secret character built for special naval and military requirements. Surgical and dental instrument demands have increased to supply the medical units of the Army, Navy, and Air Corps, and since Germany, formerly the principal source of surgical instruments, has been cut off the market, impetus has been given to domestic manufacture to supply the needs of foreign and home buyers as well as the new demands of the defense program.

Most instruments are relatively small, light in weight, made up of many intricate parts and assemblies so that direct labor employed is a primary factor in production cost. The light work, the many small parts, and the painstaking requirements of certain operations make instrument manufacture a field especially adaptable to the employment of women.

Scope of survey.

Eastern States have most of the instrument plants, with a few in the mid-West but practically none in the South and West. Seventeen factories in New York, New Jersey, Pennsylvania, Illinois, and Minnesota manufacturing aircraft, fire-control, and surgical and dental instruments, and related electrical parts, were visited to observe the work and the possibilities of employing women. The number of factory operatives ranged from approximately 100 to 6,000; the number of women employed was from 6 to nearly 1,400, with the proportion of women varying from about 3 percent to almost 50 percent of the total.

Minimum-wage rates and daily work-hour shifts.

Minimum hourly rates paid to women ranged from 35 to 55 cents, with 40 cents the most frequently reported, while for men the range was 40 to 61 cents, with 55 cents the most common.

All but 2 plants had more than one shift for the workers, with the numbers employed decreasing materially on the second and third shifts. At the time of survey, 8 plants had two shifts and 7 had three. Women predominantly were employed on the first shift, and in only 3 plants were a small proportion of women working on the second.

SUMMARY

In normal times, the manufacture of instruments of the types covered was on a relatively small scale, and much of the production of aircraft and fire-control instruments was on a constantly changing and experimental basis. For many years, machining and assembly were done almost entirely by men classed as all-round skilled instrument makers. But with increased production, jobs have been broken down and women employed to a considerable extent. The proportion of women and the jobs on which they are employed, however, differ materially from plant to plant. In some plants women are working satisfactorily on machine and assembly operations, while for the same jobs in other plants women have never been considered. In the sections of this report dealing with each type of instrument—aircraft, fire-control, and surgical and dental--the actual work being done by women is discussed. The summary presented here is merely indicative of the kinds of work being done and the feasibility of extending the employment of women on the various processes.

Summary of Principal Operations and the Employment Opportunities for Women in the Manufacture of Aircraft, Optical and Fire-Control, and Surgical and Dental Instruments

	Sex of present operatives (M-male F-female)	Extension of women's employment
AIRCRAFT INSTRUMENTS		
Assembly and Bench Work		
Mechanism subassembly	M and F	Proportion could be increased.
Mechanism final assembly	M and F	Ditto.
Special assemblies:		
Diaphragm	M	Could be used entirely.
Pitot tube	M	Slight probability of using.
Gyro motors	M and F	Proportion could be increased.
Autosyn electric motors	M and F	Ditto.
Closing of instruments	M and F	Could be used entirely.
Testing and Inspecting		
Parts inspection	M and F	Proportion could be increased if trained or upgraded from instrument-assembly operations.
Calibrating	M and F	
Electrical tests	M and F	
Cold, vibration, and run tests	M and F	
Final instrument inspection	M	
OPTICAL AND FIRE-CONTROL INSTRUMENTS		
Optical Work		
Blocking	M and F	Only a few women are used on single-spindle blocking and polishing.
Grinding	M	
Polishing	M and F	
Centering	M and F	With training, women could be used or proportion might be increased on all operations.
Cementing; engraving; etching and silvering	M and F	
Cleaning and inspecting	M and F	
Assembly and Bench Work		
Range and height finders, panoramic sights, periscopes, plotting boards, quadrants, sextants, octants, etc.		
Minor subassemblies	M and F	Subassemblies made by women are very minor and not much possibility of increasing proportion.
Main assemblies	M	
Binoculars, telescopes, aircraft sights, and small gunsights		
Mounting, cleaning, and inspecting optical parts	M and F	Proportion could be increased.
Sighting, adjusting, collimating, calibrating, etc	M	With training, women could do in part.

 Summary of Principal Operations, etc.—Continued.

	Sex of present operatives (M-male F-female)	Extension of women's employment
SURGICAL AND DENTAL INSTRUMENTS		
Assembly and Bench Work		
Forceps, pliers, retractors, etc.	M	Slight probability of increasing proportion.
Dental stands and chairs:		
Minor subassemblies	M and F	
Main assemblies	M	
Dental hand pieces and fittings	M and F	Proportion could be increased.
Clinical thermometers	M and F	Women employed extensively.
Special Machining of Dental Burs and Broaches	M and F	Women employed extensively.
GENERAL OPERATIONS APPLICABLE TO MOST INSTRUMENTS AND SMALL METALS PRODUCTION		
Heavy Duty Machines		
Drill presses	M and F	Proportion could be increased.
Punch presses	M and F	Ditto.
Milling machines	M and F	Ditto.
Metal polishing and grinding	M	Not suitable for women.
Turret lathes	M	With extensive training women could be used on lighter machines. Otherwise, probability slight.
Engine lathes	M	
Hand screw machines	M	
Automatic screw machines	M	
Gear cutters	M	
Secondary or Light Machines		
Bench, watchmakers' lathes, etc. (turning, buffing, burnishing, burring, lapping, etc.)	M and F	Women employed quite generally and they could do more of light work.
Micro-milling	M and F	
Sensitive drill press	M and F	
Small automatic screw	M	Slight probability without extensive training.
Hand and Machine Burring	M and F	Proportion could be increased.
Machine-Shop Inspection	M	Slight probability of employment.
Painting		
Spray	M and F	Proportion could be increased.
Touch-up and brush	M and F	Women employed extensively.
Fill-in	M and F	Ditto.
Radium	F	------
Graduating and Engraving	M and F	Proportion could be increased.
Heat Treating, Plating, and Anodizing	M	Not suitable.
Inspecting, Cleaning, Wrapping for Stock and Shipment	M and F	Proportion could be increased.

Training.

In Great Britain special training courses have been offered to women as well as men in the making and fitting of instruments. Instruction covering both theory and practical application is provided in correct use of tools, gages, calipers, verniers, micrometers, and in blueprint reading, soldering, buffing, drill presses, lathes, gear cutters, milling, precision fitting, and bench assembly. In the United States, in the defense training program in most of the cities visited, general courses in machine-shop practice and assembly were open to relatively few women. Only two plants had courses of study and specific training programs as formal instruction for employees, and in one plant only men had been admitted because the training was given primarily as part of an upgrading plan and the policy was not to consider women as parties to job progression beyond unskilled repetitive work. In all other plants, training was on the job. Many of the beginning jobs in the machine shop, assembly, and inspection sections are closed to women, as these operations are regarded as the beginning step for young boys who progress to more skilled work.

Attitudes with reference to the employment of women.

Three plants that employ women on a variety of operations and in relatively large proportions have the most open-minded attitude toward increasing employment possibilities for women. Though most of the work on instruments is light, and little is beyond the physical capabilities of women, the prejudice and attitude of many in managerial positions is hedged against women. In the plants with a small proportion of women employed there is often an expression of opinion that men and women cannot be employed on a coworker basis. Ideas are expressed that mixing men and women in the shop may disrupt the morale and discipline; men do not like to have women around, as in some way their work freedom is curbed. In plants where the proportion of women is large, or where women have been employed a long time, no mention is made of disciplinarian problems.

Though most of the plants have never offered any special training to women for job progression and upgrading, have never tried to give women training or responsibility for set-up of machines and have limited their work to unskilled repetitive tasks, the generalization often is made that women have no mechanical ability, interest, or aptitude. In a few plants where women are given the responsibility, some set up their machines. England has many examples of women setting up and operating machines and working on all types of materials.

Even where much of the work is on a quantity basis with specialization in jobs, the all-round skills and flexibility of men are emphasized as imperative. Flexibility in the working hours and the ability of men to hold up against long hours and heavy work frequently are mentioned even when most of the employees work on an 8-hour day shift and very little of the work requires strength. Along these lines is an expression of opinion that to employ women on jobs that might involve any hazards of maiming or disfiguring the worker is an undesirable policy because injuries to women

are regarded with greater concern by the community and may result in antagonism toward the management. British experience, however, has shown a decreasing accident rate on certain machine jobs where women have replaced men.

The problem of providing additional service facilities such as toilet, wash, and cloak rooms looms unduly significant to some employers even where new buildings and equipment are being provided in the expansion program and the inclusion of special facilities for women could be planned. Inquiry has been made recently in the East as to the cost of providing toilet and washing facilities for 100 women. The estimated cost for 5 toilets, 5 lavatories, soap, towel containers, and so forth, partitions, painting, and installation was $479, or an average of about $5 a woman.

The various anti-woman-employing attitudes expressed by management are premised largely on tradition and fear of innovations in personnel set-up.

AIRCRAFT INSTRUMENTS

Twenty-five years ago, at the time of the first World War, flying was relatively in a preinstrument stage, the flyers being guided largely by direct observations of land marks, the feel of the wind, the visible horizon, and the sense of gaining speed and height. Today the instrument panel of the modern airplane is covered with a maze of dials to guide the pilot. Instruments usually are grouped according to their function. The four principal follow: 1/

1. The primary flight group includes the air-speed, turn-and-bank, and rate-of-climb indicators.

2. The secondary flight group includes the altimeter, artificial horizon, or gyro-horizon, and directional gyro.

3. The engine instruments include oil and fuel pressure gages, suction gages, tachometers, temperature gages, electrical indicating systems, and so forth.

4. Auxiliary instruments comprise those concerned with the recording of the functioning of auxiliary apparatus, such as landing-gear-position indicators, flap-position indicators, outside-air-temperature indicators, and related electrical systems.

Aircraft instruments are all small and light in weight, most of them weighing less than 2 pounds, and as such their manufacture is chiefly light work, much of which is adapted to the employment of women.

1/ Patton, Orion Edward, Aircraft Instruments, 1941, pp. 171-172.

Until the present defense program the manufacture of aircraft instruments had been almost entirely an occupational field for men. The all-round instrument maker was distinguished in that he could machine, assemble, and adjust an entire instrument. Aircraft instruments are now being made in relatively large quantities and the operations have been broken down in the machining, assembly, and adjusting processes. Many of the instrument workers who have come into the industry during the present defense period are young, inexperienced employees; some are, and more might be, women.

Machining of aircraft instruments.

The regular standard machine shops of the aircraft instrument plants hire only a very small proportion of women employees. The women are employed almost exclusively as drill-press operators, except for a few on small punch presses. Many of the punch presses are of the kick-press type, the continuous operation of which is strenuous and not desirable for women. No women are employed on regular lathes, turret lathes, automatic screw machines, milling machines, grinders, gear cutters, and other heavy duty machines. Young men with no experience or only that secured in defense training classes have been hired in the past year for much of the primary machining on milling machines, drill presses, and punch presses, and more of this work might be done by women. The main machine-shop operations on aircraft instruments do not afford employment to nearly so many as the assembly and light machining departments.

Most of the unskilled and repetitive jobs are used as beginning occupations for men who are to be trained as machinists in an upgrading plan. Women have not been considered as potential trainees in a long-time program. In most places, tradition and attitude are against the employment of women. The oiliness of the work, the hazards of cuts, are emphasized; and the prevalent idea that women lack interest in and mechanical aptitude for machine-shop work is most marked. British industries are reporting the employment of women machine-shop workers who set up their own machines to drawings and operate all types of machines for grinding, turning, boring, milling, threading, tapping, reaming, and forming on hydraulic presses. In the plants visited in the United States the most accepted possibilities of increased employment of women from a management point of view seemed to be on drill presses and punch presses, the opportunities on the first being the greater.

Floor inspection in the machine shop was done by men who were skilled mechanics able to give advice as to set-up and machining. Hand and machine burring of machined parts was done largely by men, but a few women were used to a limited extent. Apprentices often are started on this type of work and it might be a beginning job for women in machine-shop operations.

Apart from the main machine shop, there are many secondary or light machining operations frequently related to assembly and often accompanying progressive steps in the building up of an instrument. The machines used on these operations are small sensitive drills, bench

lathes, watchmakers' lathes, small automatic screw machines, micro-milling machines, burring, burnishing, buffing, and lapping machines, gear hobbers, and so forth. On these smaller machines more women are employed and their numbers might be increased materially. In several plants men and women are operating the same kinds of machines, but often the men are reported as doing precision work on turning and fitting operations that require changing set-ups and more diverse skills. Much of the work of machining, polishing, lapping, and drilling on the lighter machines is for the small internal mechanism of instruments, such as pinions, rocking shafts, gears, and fittings. The work is held to fine tolerance—often in ten-thousandths of an inch—and gages, microscopes, and micrometers are used in checking the progress and accuracy of the work.

In a high-grade British instrument factory, women set up and operate Mikron capstan lathes and Mikron gear hobbing machines, and check tooth profiles and make necessary adjustments. They work with micrometers and to tolerances of 2 and 3 ten-thousandths of an inch.

Aircraft instrument assembly and bench work.

Most of the pressure-actuated instruments consist of a metal or plastic case, bezel or snap rings, front glass, dial, pointers, and the internal mechanism, which includes a diaphragm assembly, rocking shaft assembly, hand staff assembly, sector assembly, wheel and hair spring assembly, bearing plate, balance arm, and mechanism frame.

Diaphragms made of paper-thin corrugated metal discs are a part of all instruments where pressure is the activating element. The contraction and expansion due to variations in pressure are relayed to the dial indicator. If the diaphragm is defective, the entire instrument must be disassembled or scrapped. So, great care is given to its manufacture and assembly. In 3 factories where diaphragm instruments are assembled, the work is carried on in a small separate department, and the operatives work interchangeably on several jobs. Blanking and corrugating of the discs are press operations, which require care in handling the metal so that it is not stretched. Next, the discs are seasoned in hot baths of oils, soldered, evacuated, and tested for leaks and sensitivity. Women do soldering, but all other operations are done by men in the aircraft-instrument plants. However, in a plant manufacturing pressure instruments but not for aircraft outlets, women are making the diaphragms in their entirety.

Special apparatus such as the Pitot static tube has been developed for controlling the intake of air actuating the diaphragm. The manufacture of the Pitot tube is done entirely by men and involves chiefly torch soldering, assembly of small tubing, filing, plating, and polishing. Much of the work is varied and heavy, and with the small numbers employed there would be little need or possibility of women's employment.

Most women's jobs on aircraft instruments are on the mechanism subassemblies involving use of hand tools such as pliers, soldering irons, tweezers, files, hand mallets, screw drivers, hand drills, bench fixtures, and machines such as arbor presses for staking and riveting,

small polishing, lapping, and buffing machines. With these operations there frequently is accompanying inspection using microscope, jeweler's loupe, and gages.

Women in one of the three largest aircraft instrument factories do practically all the work on the rocking shaft subassembly, hair springs, sector assembly, balance arm, and other mechanism subassemblies, including staking jewels into plates, assembling small bearings, staking counterweights to dial pointers, soldering small parts, putting in pivot screws, and so forth. In the other large aircraft instrument plants women are doing a share of these subassembly operations but the majority of the subassemblers are men. As the force expands in all the plants the proportion of women is to be increased, and an estimate was made that they could do at least 75 percent of the assembly work.

The final assembly of an instrument is akin to watchmaking—installing the subassemblies such as the diaphragm, rocking shaft and sector; aligning and fitting parts to close tolerances; adjusting jewels, checking friction, checking end play, and making other necessary adjustments. This work is the sphere of the all-round instrument maker and so far has recruited experienced men or developed them from subassemblers by an upgrading program.

The final assembly of the mechanism calls for a high degree of skill and responsibility, a thorough knowledge and understanding of the use of the instrument being constructed, and a practical knowledge of the field in which the instrument is being used. Only 2 women in the aircraft plants visited were reported as final assemblers and all-round instrument makers capable of all assembly processes. Women might constitute a substantial part of the final assemblers if they had the training, experience, mechanical aptitude, and interest, and if management were open-minded to the possibilities of employing them.

After the mechanism has been assembled, the installation into the housing or case follows, and women are employed extensively on the closing operation. They clean and assemble the dials, pointers, and front glass, put in the gaskets, bezel or snap rings, install the end fittings, and attach the name plate.

Instruments with fewer parts and simpler mechanisms, such as the compass, tend to employ a larger proportion of women in assembly. One firm with a separate department for manufacturing the magnetic compass uses almost 50 percent women on this assembly. Women are on the usual repetitive jobs of subassembly category, soldering, peening, screwing, and adjusting parts and fittings. Final assembly was carried on almost entirely by men.

Testing and inspecting aircraft instruments.

Inspecting and adjusting are concomitant in much of the assembly work. Women as well as men do testing along with assembly. For instance, in the assembly of magnetic compass (simpler than gyro-compass) both men and women balance spider cards—the revolving graduated scale for weight

distribution. Women are checking the magnetization of compass balance bearings on a special projecting and enlarging device. The final setting and adjusting of the compass is considered a most skilled job and is done by men.

Cold tests, vibration tests, and compensating bath tests employ only a few men, who work interchangeably at all operations and most of whom know how to make the necessary adjustments on a variety of types of instruments.

Calibration covers testing, adjusting, balancing, and measuring the performance of instruments according to definite standards. Calculations and computations for adjustments may be necessary and the calibrator of the more intricate instruments needs a working knowledge of mathematics and principles of physics involved. In all but one of the plants visited, the final testing of aircraft instruments was carried on solely by men; in the one exception a woman was calibrating suction gages, which are among the simpler instruments. She had been employed in a watch factory and was said to have exceptional mechanical ability. Many of the men calibrating were reported as having years of experience in instrument making or as holding degrees in mechanical engineering. The opinion was expressed that if there is quantity production of one type of aircraft instrument, women might be trained in 3 to 6 weeks to do calibrating of some types of instruments.

Inspection of incoming parts and those in process employs both men and women, the latter working on the simpler gage and visual checking. Of course women could do more of the inspection. Men usually are employed on metal hardness testing, checking with verniers, calipers, blueprints, and where mathematical computations are involved.

In a large instrument plant that manufactures navy and commercial barometers, automobile altimeters, and compasses similar to certain of the aircraft instruments, women have been employed extensively for many years. In fact, women assembled aircraft altimeters in this plant in the war of 1914-1918. At the present time practically all assembly on commercial barometers, hygrometers, and altimeters for automobiles is done by women. The assembly of many of these instruments involves installing a diaphragm, hair springs, shafts, pinions, dial indicators, and so forth, all similar to operations on aircraft instruments. Women are calibrating these instruments also, and one woman with years of experience calibrated navy barometers.

Similarly, in a mass production plant that specializes in the manufacture of instruments for the panel boards of automobiles, women are assembling ammeters, oil and pressure gages, speedometers, and other instruments on a line assembly and testing for end play and leaks, making final adjustments, and calibrating. Men are serving as group leaders and set-up men. The tolerances on such instruments are not so close as on aircraft, but the operations are similar and there is no reason for assuming that women could not develop the skill necessary to do similar operations on the more delicately adjusted aircraft instruments.

Gyroscopic aircraft instrument assembly.

Another group of instruments are those based on the gyroscopic principle, that is, a spinning wheel mounted and suspended in such a manner that it is free to rotate about any axis, maintaining a fixed position irrespective of the oscillations of the plane. The instruments important in blind flying and automatic piloting of a plane are the gyroscopic compass, the directional gyro, the turn-and-bank indicator, and the artificial horizon.

Two plants visited are making this type of instrument. In the plant of the largest manufacturer of gyroscopic instruments women comprise less than 10 percent, while the other has a considerably larger proportion. In a British plant, women with high degrees of skill are reported as operators of lathes and milling and grinding machines, as assemblers, balancers, and testers of fine gyroscopic instruments with tolerances and limits as close as 2 ten-thousandths of an inch. 2/ In the main plant of this same company in the United States, women assemblers are classed as unskilled repetitive workers. The women are on light bench jobs assembling rotor housings, centering rotors into the gimbal, making minor hand adjustments, cleaning bearings, lapping shafts, pivots, and bearings, and using microscopes for inspecting the parts being lapped. All the actual instrument assembly is done by men and the job of a first-class assembler is described as follows:

> Plans and lays out assembly work from blueprints or samples and develops new ideas for simplifying and improving such work. Has a thorough knowledge of machine-shop mathematics. Assembles all types of subassemblies and main assemblies without the use of jigs and fixtures. Skillful in the use of all types of precision measuring tools and indicating devices. Skillful in soldering, filing, fitting, scraping, reaming, pinning, lapping, drilling, turning, milling and other bench and machine-tool operations required in precision assembly. Able to meet production standards in quantity and tolerances.

In a firm manufacturing turn-and-bank indicators women do a major part of the assembly work, such as mounting the gyro motors (until recently done only by men), oiling shafts and putting bearings in the gyro frames, and installing the inclinometer and pointer or indicator assembly.

Again there is no doubt that, if afforded the same training opportunities as men, women could comprise a much larger proportion of the workers.

Testing and inspecting gyroscopic instruments.

Gyroscopic instruments, like other aircraft instruments, are checked in process of assembly, women doing practically all the testing on the smaller rotors being assembled into the gimbal ring, including testing of

2/ Engineering Bulletin of the Ministry of Labor, August 1941.

spring tension, making run tests to ease parts, and vibration tests to detect the slightest friction in movement. Men do the assembly and inspection on the larger and more complicated rotors. Men also balance the rotors on an automatic balancing machine, a job that women might do. Prior to calibrating the directional gyro and artificial horizon women are visually inspecting and cleaning the cases, dials, dial glasses, and internal mechanism. They also check the drift and make simple adjustments on directional gyros, and calibrate and adjust artificial horizons, both these operations requiring approximately 3 to 5 months' training to attain proficiency in making adjustments to close tolerances. The final testing and calibrating is done by men, many of whom have had training in engineering and are able to make a complete visual and mechanical inspection using varied testing equipment.

Electrical indicating systems.

Engine control instruments such as tachometers, manifold pressure gages, oil and fuel pressure gages, temperature gages, and electrical thermometers, and auxiliary instruments for designating the position of wing flaps, landing gears, wheels, cowl flaps, frequently are dependent on electrical transmission for their indications. Many are tied up with a self-synchronous motor, called an autosyn or telegon, for remote indication of the instrument reading by electrical wiring, which eliminates tubing and mechanical connections and enables multiple indication on one dial.

The autosyn system of remote indicating might be applied to almost any aircraft instrument. It is a combination of transmitting and indicating elements that may be widely separated. A transmitting motor is mounted near the part of the plane whose performance is to be recorded, and the second motor is located on the instrument board controlling the dial indicators or pointers. These autosyns are small fractional horsepower electric motors, and are significant in the manufacture of aircraft instruments. As in the electrical industry, women are employed on much of the work, which is of a machine-shop and assembly nature. Women are employed extensively on drill presses and punch presses and might be used on other machine operations.

Winding of armatures, field coils, and stators; coil taping and forming; assembling armatures and commutators; soldering and connecting wires, and other electrical jobs are done in part by women, and they could do more of the work because of the small size of autosyns. In some plants men are doing much of the final assembly of the autosyn motors but women could share in the work.

Testing of electric indicating systems includes tests for grounds and shorts, break-down tests, electrical accuracy tests, and time response and performance tests. All these are tests for which women might be trained in a short time. At present, most testing jobs of this kind are held by men.

Miscellaneous jobs on aircraft instruments.

Most of the panel-board instruments have luminous dials and indicators to give visibility for night flying. Radium painting is being done entirely by women in the 5 plants manufacturing aircraft instruments. Work benches have individual glass-shielded hoods connected with exhausts; rooms are air conditioned; uniforms are provided and laundered by the firm; periodic physical examinations are given; hands must be washed before leaving the room and are usually examined by the forelady for any particles of luminous paint; and extra clean-up time is allowed at noon and in the evening. The work is painstaking, fine, requiring finger dexterity, and hazardous if prescribed precautions are not respected.

Touch-up painting is quite generally done by women. Stenciling of dials and fill-in painting are other jobs usually held by women. Spray painting, on the other hand, is almost always considered men's work, though women might do it because of the lightness of the parts.

Graduating and engraving.

Pantographs, special engraving machines, and addressing machines, for engraving and imprinting metal dials and name plates, are operated by both men and women. Women might be used on all such jobs.

Other miscellaneous jobs.

Heat treating, anodizing, and plating require only a very small proportion of the total labor force, and the work is varied, heavy, and not advisable for women as all-round workers. In the larger plants women sometimes wire and rack small parts before and after processing, but the number of jobs of this kind is insignificant.

Many of the aircraft instrument cases are made of plastics such as bakelite and all the presses molding these are operated by men. Women undoubtedly could be trained to operate and control temperatures on the new automatic molding machine.

Tool-crib attendants are all men. In the large plants women might be used in keeping records and issuing the lighter tools. Women are used to a limited extent in packing instruments and parts for stock and shipment. More undoubtedly could be employed on such work. Work in the foundry and pattern shops requires skills which would have little value in the general woman labor market and much of it is far too heavy.

OPTICAL AND FIRE-CONTROL INSTRUMENTS

Every heavy gun must be accompanied by auxiliary equipment for controlling its fire, properly aiming the gun and setting the shell fuze. Fire-control instruments predetermine the accuracy and check on the effectiveness of gunfire and aircraft bombing. Fire-control and optical instruments include range and height finders for determining the distance between the gun and the target, periscopes for observing and directing the firing of torpedoes from submarines, gunsights, panoramic telescopes, prism binoculars, aiming circles, azimuth instruments, elevation quadrants, sextants, bubble octants, clinometers, plotting boards, drift sights and drift meters for aircraft, fuze setters, and so forth.

Optical-glass manufacturing.

The largest manufacturer of optical glass for fire-control instruments was visited. Mixing, melting, and the early steps in the manufacture of glass are heavy work and unsuitable for women, but women are used extensively in cleaning and inspecting glass. After the glass is cooled, the melting pot is broken away with a sledge hammer and the glass is inspected in large pieces by men cutting away all obviously defective parts. It is then subjected to close inspection by both men and women for strae, strain, and bubbles. Men weigh, mold, and press optical glass. Molding and pressing are skilled tasks, the work is hot and strenuous, and there is slight probability that women might qualify or be acceptable to the management. The burring of rough edges and the indexing of optical glass—the latter more or less a laboratory job—are suitable work for women, but none are employed. All the women are on light, unskilled work, cleaning, weighing, inspecting, and packing into trays, with a larger proportion of women working on ophthalmic glass rather than optical.

Lens grinding and polishing.

Optical lenses and prisms probably are the most important and basic components in optical instruments and lens grinding and polishing are fundamental jobs. Six of the plants visited are grinding and polishing their own optical elements. Blocking, grinding, and polishing of various degrees or stages, silvering, etching, centering, edge grinding, cementing, and correcting are operations in processing of lenses and prisms. In times of normal production, the precision optical worker is expected to be able, if necessary, to carry out all these operations, but during emergency periods when the expansion in production of optical instruments demands many times the usual output, specialization in jobs has become a necessity and inexperienced workers are being trained.

Very few women have been known to do blocking, grinding, and polishing of optical elements; and there is considerable diversity of opinion as to women's ability to do this work because of the traditional skill attached to the trade. A few were found doing single-spindle blocking and polishing. When grinding and polishing requires handling of heavy cast-iron blockers, the work is too heavy for women, but with specialization in the manufacture of a variety of optics, women undoubtedly could be trained to do the lighter grinding, using small blockers and single spindles.

Sometimes the initial grinding of roughing and smoothing is by hand, but considerable finger and hand pressure must be exercised and the abrasives and rouge are hard on the hands. The grinder and polisher must acquire a feel for the proper rotary motion and suction of the blockers or spindles. Some of the grinding and polishing was reported as requiring not more than 6 months to a year to attain skill, depending on the type of work and the precision required.

In the process of polishing, the lens must be checked with a test gage to determine the exactness of the work, and on some of the fire-control optics the tolerances are so fine that only men with many years of experience are considered able to carry on the work. But not all the polishing is of such precision. In an instrument factory in Scotland, women do optical grinding and polishing to extremely fine tolerances.

Women's work on optics at the present time is largely centering, silvering, etching, cleaning, and inspecting. Women do a great deal of cleaning, which is work of most careful and painstaking nature, removing microscopic specks with small vacuums and cleaning solvents and visually inspecting lenses and prisms with the aid of magnifying glasses. In centering, considerable skill is required in mounting the lens for edge grinding so that the exact optical center is obtained. Once the lens is mounted and the center secured, the machine grinding of the edges is an automatic process. Centering is being taught to girls in 3 months or less. A trainee works with an experienced operator.

Women often are employed with men on interchangeable jobs in the etching of glass. The glass is first given a wax coating, and then a pantograph engraving machine cuts the surface of the wax and hydrofluoric acid etches the lines on the lens or prism. Women are doing all this work, though the usual comment was that the most precise work requires men. Silvering, shellacking, and painting of optical elements are among the simpler operations and all are done by women as well as men. The number of women could be extended in a time of emergency.

Compound lenses are constructed by cementing—applying hot balsam with a brush—lenses of different qualities. Light pressure to exclude the bubbles of air between the lenses is applied and the operation requires the utmost delicacy of touch. For this reason women have been considered desirable and acceptable for the job and are used almost entirely.

Since women in the larger plants have proved proficient in centering, cementing, engraving, etching, silvering, and inspecting, a definite feasibility seems to be that if women's occupational opportunities were extended to blocking, grinding, and polishing they could meet the demands of such work. The traditions of the industry in the grinding and polishing of precision optics are hedged with attitudes that such occupations are almost monastically male, but if optical elements become increasingly a bottleneck in the production of fire-control instruments, more inexperienced workers must be trained and a good share of the work might be done by women. Basic requirements are patience and skill to work to precise tolerances in terms of wave lengths, and many industries have accepted as a truism the fact that women excel on work that requires great attention to detail.

Assembly of optical and fire-control instruments.

The larger fire-control instruments are very intricate and are still made on a custom-shop basis. Range and height finders weighing 5 tons or more, having more than a thousand mechanical parts, 150 or more optical elements with numerous multiple prisms, may take more than a year to build. Since only a few men with long optical-work histories are considered sufficiently skilled to assemble such an instrument, women could not be expected to augment this group. On other fire-control and optical instruments, such as panoramic sights, periscopes, plotting boards, quadrants, sextants and octants, the work is not on a quantity production basis even in an emergency, operatives with versatility in skills are necessary, and women are used only on a few minor subassemblies.

Binoculars are the only fire-control instrument on which women are employed extensively. Women are cleaning, inspecting, mounting, and setting optical parts such as lenses, porroprisms, and reticles into the case or housing, and staking and making minor adjustments of the position of the parts. Similar work is being done by women on telescopes, aircraft sights, and small gun sights.

Sighting, adjusting for parallax, checking definition and focal length, collimating, calibrating, and other final testing is done by men on all optical instruments, including the simpler binoculars and telescopes. Men often have progressed to these jobs from machining and assembly and have a general knowledge of the optical and mechanical systems, and their applications for fire-control purposes, which is a background possessed by few women. On some of the instruments such as binoculars and small telescopes, made in large quantities, women should be afforded the opportunity to be upgraded from assembly operations to some of the testing work.

After all the adjustments and tests have been made on binoculars, women are doing the final closing of binoculars, disassembling eye pieces and objective lens, cleaning with vacuum lines, fine brushes, cleaning solvents, replacing the cleaned parts, greasing threads, waterproofing screws, seams, and so forth.

Machining of optical and fire-control instruments.

In addition to the optical work there is a great deal of machining and assembling of metal parts. A large proportion of the men in the machine shops are skilled mechanics able to set up all basic machines, follow intricate blueprints, and work to very fine tolerances. As in the aircraft-instrument machine shops, women are most frequently employed as operators of drill presses and occasionally on milling machines, light punch presses, and bench lathe applications such as burring, lapping, and diamond turning for finishing surfaces. The proportion of women employed in the machining of instruments is small, and machine set-ups are all made by men except in two instances where women milling-machine operators make their own set-ups. All other machines are operated by men. The present possibilities of extending women's employment seems slight, except for a larger proportion of the drilling, milling, bench lathe, and punch-press operations and some of the work on smaller hand screw machines and special applications of automatic lathes where long runs are common.

Miscellaneous jobs.

Painting, plating, heat treating, graduating, and engraving of metal parts, and other miscellaneous jobs, are similar to those on aircraft instruments that have been noted in that section of the report.

SURGICAL AND DENTAL INSTRUMENTS AND EQUIPMENT

The elimination of German competition and the defense orders for surgical and dental instruments have given this industry a defense boom. Prior to the war of 1914-1918 about 85 percent of all surgical instruments used in the United States were manufactured in Europe, and though the industry got a footing in this country during the 1917-1921 period, the United States markets were recaptured by Germany for a decade or more. In the last few years the industry has experienced another war and a great domestic demand, and it is gradually building up to meeting 100 percent of the domestic needs. In addition, exports to Europe, Canada, Latin America, and Asia are increasing each year. Since the industry has come into prominence within the last few years, few skilled, experienced instrument makers are available, and the industry has had to take young men and train them as instrument makers. The Women's Bureau was interested in discovering to what extent and on what occupations women might be trained for work on surgical and dental instruments and equipment.

In terms of total number of wage earners, the surgical and dental industries are small. The industry centers in New York, Pennsylvania, and Ohio, with marked concentration in the first and second. Almost three-fourths of the workers in dental equipment and dental supplies in the country are reported in New York and Pennsylvania, and the largest surgical-instrument manufactures are in New York State.

Five firms in New York State making surgical instruments, dental equipment and instruments, and clinical thermometers were visited. In 2 plants employing 661, of whom 20 were women, only surgical instruments and supplies were made. In the 2 dental equipment and dental goods plants, and 1 thermometer factory, employing 3,147 workers (759 of them women), there was considerable diversification of products and not all would fall in the field of surgical and dental instruments.

Surgical instruments.

In the 2 firms manufacturing surgical instruments, such as hemostatic and other forceps, retractors, surgical scissors, knives, saws, scalpels, syringes, and so forth, the women are employed on only a few jobs, cleaning, inspecting, and wrapping the articles for stock and shipment. Altogether there were only 20 women reported in the 2 firms, or about 3 percent of the productive workers.

Surgical instruments are made of tool and stainless steels, which present special problems of processing. Forging, annealing, stripping stainless steel, plating tungsten steel, and heat treating are relatively insignificant in the numbers employed, and due to the heaviness and the conditions of work are not considered jobs to be advised for women. After the forgings have been trimmed, milling surfaces and cutting serrations are the most common machining operations, aside from grinding and polishing. Most of the men set up their own machines and must be able to perform a variety of progressive operations on several types of instruments. A few women might be employed on these operations.

Rough grinding, polishing, and buffing comprise a major part of the work, with a series of operations using successively finer abrasives until the final polishing—known as coloring—is done on rag wheels. In general, these operations are decidedly heavy and dirty. On the coarser carborundum wheels, there are flying particles in spite of exhausts, odors of hot metal, and on all grinding and polishing a firm grasp and hand pressure must be exerted on the instrument against the wheel. Generally the work would hardly seem desirable to many women, for in addition to the strain there is a constant spattering of buffing paste, rouge, fine dust covering hands, face, and clothing. The one job that seems feasible for women is the final color buffing to give a high polish to the metal, but this too is usually a strenuous job and does not employ any appreciable number.

Almost one-half of the employees are on miscellaneous operations of a bench-work nature such as hand filing, fitting, adjusting, soldering, or brazing, and like machining this work is not essentially repetitive and the employee must be versatile, using all sorts of tools and light machines. Bench lathes are used in burring and adjusting and most of the drilling is combined with assembly. Burring and filing are not light jobs, as the steels used are hard and considerable pressure must be applied to the file. Fitting, setting, and assembly requires an estimated minimum of a year's experience to get close adjustments

and proper play. Most of the inspection is coupled with the processing. Some of the final assembly jobs are riveting and screwing parts together, inserting springs, breaking-in joints, and oiling. Visual inspection and testing the grip of instruments are done by both men and women.

Though the heaviness of the work, the hardness of the metal, and the variety of the operations were stressed by management as a bar to the employment of women, there are some light jobs that women might do in machining, fitting, soldering, and handling the lighter instruments, if the emergency program demands increased employment of women. Even so, the manufacture of surgical instruments would never afford any marked opportunity for employment of women, as even now, when foreign competition has been drastically curtailed, the industry is limited in size.

Thermometers.

In one firm manufacturing clinical thermometers women are now employed on all the major processes. Women are gaging diameter of tubes, cutting tubes to prescribed lengths, blowing and gaging end bulbs, trimming and sealing the ends, pointing, graduating and engraving, fill-in painting, inspecting, and packing. Pointing is marking the thermometer to indicate prescribed temperature points in a controlled bath. Graduating and engraving of scales, serial numbers, company name are done by both men and women on single and gang pantographs. Waxing preparatory to engraving and all the fill-in painting of scales are done by women. Women are used almost entirely, so there is little if any opportunity for further extension.

Sphygmomanometers also are largely a product of women's work. Women do all the assembly, the cutting and sewing of the sleeve, the pointing of the dial, machining and calibrating operations on the instrument mechanism—work similar to that on aircraft instruments.

Dental instruments and equipment.

Two-thirds of the wage earners in the dental manufacturing industry are in New York and Pennsylvania, and 2 of the largest firms in the country were visited. Products of the 2 firms include dental instruments such as burs, broaches, drills, hand pieces and tools for hand pieces, abrasive points, forceps, pliers, explorers, chisels and cutting instruments; equipment such as chairs, stands with accessory fittings, sterilizers, dental gas apparatus, X-ray equipment, dental lights, and so forth; and consumable materials and supplies such as dental gold, alloys for amalgams and fillings, cement, teeth, orthodontic appliances, waxes, and so on; and in addition nondental products such as aircraft compasses, small electric motors, coils, and accessory parts for aircraft, flexible shafting, and special custom work on small plastic and metal parts.

The manufacture of consumable materials and supplies is more allied to the laboratory processing and the packaging of a pharmaceutical plant than to a metal plant making instruments. Women are used as packers,

labelers, and sorters, and the skills and training required are quite different from those of a metal plant. The mixing and processing is done by a small number of men and involves lifting raw materials and tending a number of machines.

Machining of instruments and equipment.

In the standard heavy-duty machine shop, all machines except a few drill presses are operated by men. Women might do more of the drilling, and also part of the work on punch presses, hand-screw machines, and milling.

Dental instruments of the forcep, plier, and chisel type have the same sequence of machining operations as surgical instruments such as retractors, hemostats, and so forth. Grinding, polishing, and buffing, the predominant machine operations, and the miscellaneous bench work for fitting and adjusting are like the operations on surgical instruments, and the same findings hold for the employment of women.

Women do all kinds of light machining on hand pieces, burs, broaches, and fittings, which are quantity production goods. They are turning, drilling, reaming, milling, lapping, and burring. Men are doing some of the same operations, but though quantity and quality of workmanship on certain processes were reported as about the same for the two sexes, the men are said to be all-round operators with experience and skills that allow them to be shifted to any operation.

Dental burs and broaches are made in about 150 styles, and are almost entirely manufactured by women, who are straightening, cutting, and inscribing the trade-mark on wire used as raw stock. Semi-automatic and special automatic machines are used for forming the end of the bur. On some operations girls are tending a battery of machines loading and checking the precision of the operations with a microscope. Broaches are ground and tapered on fine carborundum wheels and barbs are cut on a special bench machine. The operations are checked under a microscope.

On hand pieces and small accessories women are doing small subassembly, using bench tools and appliances. Practically all jobs of this nature could be done by women. Inspection of hand pieces and parts, visual and gage, is done by women.

Assembly of the chairs and dental stands is almost entirely done by men. A small number of women do some minor testing, subassembly of fitting wires and tubes, and touch-up painting. In the gradual assembly of chairs and stands, the entire framework and installation of fittings frequently is carried on by one man, the work being intermittently light and heavy. Men do final inspection, testing, and manipulation of the chairs and stands. If the volume of this type of production were greater, women might fit into the assembly work, but at present all-round experienced men are preferred.

Minor jobs in the numbers of women employed include inspecting burs and broaches on comparators, wrapping and packing for stock and shipment. Women also wrap some of the smaller parts for chairs and stands. Another minor job held by women is the tending of braiding machines, making cords to be used as pulley drives on some dental equipment. Small electric motors are made in both the dental-equipment plants, and women are employed on their usual jobs of coil winding, building up small commutators, cutting, preparing, assembling, soldering wire and terminals, and so forth. The final electrical assemblies are made by men.

No women are employed in heat treating, plating, painting (except minor touch-up painting), foundry, tool making and tool room, or operating plastic molding machines, and the job possibilities for women in these divisions are slight.

Pages missing in original

August 1, 1951

Aircraft Assembly Plants included in this report

Women's Employment in Aircraft Assembly Plants in 1942

Name of plant	Location
Beech Aircraft Corp.	Wichita, Kansas
Bell Aircraft Corp.	Buffalo, N. Y.
Bell Aircraft Corp.	Niagara Falls, N. Y.
Boeing Aircraft Corp.	Wichita, Kansas
Brewster Aeronautical Corp.	Johnsville, Pa.
Cessna Aircraft Co.	Wichita, Kansas
Consolidated Aircraft Co.	San Diego, Calif.
Consolidated Aircraft Co.	Ft. Worth, Texas 1/
Curtis-Wright Corp. #1	Buffalo, N. Y.
Curtis-Wright Corp. #2	Buffalo, N. Y.
Curtis-Wright Corp.	Columbus, Ohio
Curtis-Wright Corp.	St. Louis, Mo.
Douglas Aircraft Co.	Long Beach, Calif.
Douglas Aircraft Co.	Santa Monica, Calif.
Douglas Aircraft Co.	Tulsa, Oklahoma 1/
Fleetwing, Inc.	Bristol, Pa.
Lockheed Aircraft	Burbank, Calif.
Naval Aircraft	Philadelphia, Pa.
North American Aviation Co.	Kansas City, Kansas
North American Aviation Co.	Inglewood, Calif.
North American Aviation Co.	Dallas, Texas
Northrop Aircraft, Inc.	Hawthorne, Calif.
Piper Aircraft Corp.	Lock Haven, Pa.
Ryan Aeronautical	San Diego, Calif.
Vega	Burbank, Calif.
Vultee Aircraft, Inc.	Downey, Calif.
Vultee Aircraft, Inc.	Nashville, Tenn.
Spartan Aircraft Co.	Tulsa, Okla.

1/ Under construction at time of W. B. visit.

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Women's Employment in Aircraft Assembly Plants in 1942

INTRODUCTORY

Earlier survey.

In the spring of 1941 a report by the Women's Bureau on aircraft assembly plants pointed out that much of the work of operating production machines, bench work, sheet-metal fabrication and forming, precision assemblies in the electrical, instrument, and tubing departments, the assembly of control surfaces, wing and fuselage parts, and some of the painting, anodizing, heat-treat and plating jobs, factory clerical jobs, and others, could be done as well by women as by men. Seven of the major aircraft assembly plants were visited as a basis for this report in the spring of 1941; three of the seven employed no women and in the others only a fraction of 1 percent of the factory force were women. Most of the women were in the fabric or covering department, with a very small number in the electrical and tubing divisions. The Women's Bureau report restrained its estimate of the possibilities of employing women to roughly one-fourth to one-third of the jobs as suitable for women, partly in view of the uninterested attitude of most employers and the strong preference for men expressed in all discussions of job opportunities, training, and induction of women into their industry.

Second survey.

In the late summer and fall of 1941, requests were coming to the Women's Bureau from aircraft plants for information on employment standards and jobs for women, and reports indicated that some of the plants—even some that had been most openly hostile to the consideration of women—were beginning to employ them in other than fabric jobs, trying them out in small numbers in the electrical, sheet-metal, and other departments. Foremen were reporting their amazement that women could do as well or occasionally even better than men on light work, and also that men and women could work side by side without completely disrupting factory discipline and production.

A few public vocational schools offering courses sponsored under National Defense Training and many private fee-charging schools were admitting women to aircraft training. Then, after December 7, the practical consideration of women as a vital labor supply gained momentum and the numbers employed in aircraft factory jobs began to increase appreciably, the numbers of women from October 1941 to February 1942 increasing more than five times, and from October to April increasing more than nine times.

To secure information on the employment of women, their numbers, the work they were actually doing, future plans, employment policies, hiring requirements, and practices affecting women, and to offer coun-

sel and suggestions for the effective use of women in war-production plants, agents of the Women's Bureau, beginning in December 1941 and continuing through the first 3 months of 1942, visited 26 operating aircraft assembly plants and 2 plants under construction. The plants visited are in 9 States, California, Kansas, Missouri, New York, Ohio, Oklahoma, Pennsylvania, Tennessee, and Texas.

Light, medium, and heavy bombers, flying patrol boats, and cargo, transport, observation, fighter, pursuit, interceptor, and trainer planes were being assembled in the plants visited. Six of the plants had been included in the first survey. A total of approximately 250,000 persons were employed in the operating plants, and of these about 70 percent were classed as productive factory workers. At time of visit, women comprised 4.2 percent of the factory force. Three of the 26 plants had no women employed in the factory but may have taken on some women since. The largest proportion of women factory operatives was about 15 percent, or about 1 woman in every 7 workers. More than two-thirds of the women for whom information was secured were in California plants; 5 plants had more than 500 women, the largest number being slightly over 1,200. The numbers of women in war production change so rapidly that they have little value except as indicative of the trend. By April 1942 about 6 percent of the productive workers in aircraft assembly were women.

In the past women have not comprised an appreciable proportion even of the clerical and nonproductive force in aircraft plants, but the Women's Bureau figures showed proportions of office women, white-collar workers, ranging from about 5 percent to 75 percent; two of the smaller firms had more than 70 percent women, with the average for all plants 14.2 percent.

Up to the present the hiring of women in the aircraft industry has been largely to augment an increasing force rather than to replace men. In the past the industry has preferred young men, but as decided inroads on this group are made by Selective Service, women undoubtedly will be recruited in large numbers as substitutes for men.

Due to the many uncertainties accompanying war production, many firms were loath or unable to give a concrete estimate of the numbers or proportions of women in their anticipated future personnel, but the statements of 12 representative plants indicate that by the time peak production is attained the number of women will have increased to six or seven times the number in the early spring of 1942, and upwards of 100,000 women probably will be employed by the end of 1942. California plants may have 25,000 to 30,000 women.

In the second report of the Women's Bureau on the role of women in aircraft assembly the emphasis is on the work that women were doing in the factories, with supplemental information on the training programs, hours and shifts of work, rates of pay, requirements, and policies and practices with reference to the age, marital status, and other personnel matters affecting women.

Conclusion.

Nine times as many women are employed in aircraft assembly in the spring of 1942 as were employed in the late fall of 1941. New jobs that women can perform or to which they can be upgraded are being found almost every day, and women are doing many kinds of machine, assembly, and inspection work. Women have demonstrated

in aircraft that industrial capability is not based on sex and that the line of demarcation for men's and women's jobs is largely imaginary. If women are afforded training for and encouragement in their jobs, a much larger proportion than generally is supposed can be upgraded to fill positions requiring high degrees of skill and responsibility.

JOBS OF WOMEN IN AIRCRAFT ASSEMBLY PLANTS IN EARLY 1942

Though the over-all proportion of women in aircraft assembly was still small, plant officials' experience with the induction of women had changed many of their ideas of the nuisance value of women workers and lessened their fears and bugaboos that women were inapt mechanically and that it was impracticable for men and women to work efficiently side by side. Some of the foremen who had expressed a presumptive opposition to the induction of women in their sections were among the most effusive in their praise of the quality and quantity of the work done by women under their supervision, and were even willing to admit its equality to that of men.

Women were observed working on most of the manufacturing processes that go into the fabrication and assembly of an airplane, and were found on all the operations suggested as suitable for women in the 1941 report of the Women's Bureau. On some jobs there were only a few women in a few of the plants. Women were seen scattered through many departments as operators in the machine shop; fabricating and forming sheet metal; doing detailed and precision assembly in electrical, radio, instrument, tubing, and cable departments; building up minor and major assemblies of control surfaces for the wings, fuselage, empennage, and final assembly; welding; working with plywood, fabrics, and soundproofing; helping in paint, heat-treat, plating, and anodizing departments; inspecting; working in tool and store rooms, and as part of the factory planning, clerical, and messenger services.

MACHINE OPERATORS

A considerable share of the operation of production machines, though calling for varying degrees of skill, requires but little strength in handling parts and setting up machines; this comprises such work as drilling, milling, small lathe work, hand screw machine or turret-lathe machining, grinding, profiling, and so forth, and is possible for women. In only about one-third of the plants, and to small extent in these, were women assigned to the machine shop as such, but many machines of the production type are used in other divisions, such as the sheet-metal, metal-fittings, and assembly departments. The machine tooling and die departments require skilled mechanics who can do original and varied work to a high degree of accuracy, so women do not, and at least for the present cannot, fill many of the labor needs of this type.

Drill-press operators.

More women are employed on drill presses than on any other machine work, and they are drilling on all kinds of small metal parts, castings, extrusions, and fittings of aluminum alloy, sheet metal, and steel. To drill a hole is not difficult but to drill in the exact spot and

to the exact size requires skill. Women are employed on jig and sensitive and on single and multiple drilling. On sensitive drilling—usually light work—the operator must have a sense of feeling what the drill is doing as it spins and pushes its way through metal. In one plant where a woman operating a sensitive drill was pointed out as a recent substitute for a man the leadman explained that on her first day this woman exceeded her predecessor's production of approximately 500 parts, though he had been employed for months on the job, and that she has since maintained a daily output of double his record.

Women not only were boring holes but were working on all such drill-press applications as reaming, countersinking, counterboring, tapping, spot facing, key seating, burring, and lapping holes. Where it was customary for drill-press operators to change and sharpen their own drills, the women usually were doing this. A few women had full-time jobs dressing the points and grinding the cutting surfaces of drill tools to specified angles and shapes. In addition to the operation of stationary drill presses, even larger numbers of women were operating portable electric drills and screwdrivers on bench and floor jobs as a part of or preparatory to assembly. Personnel administrators and foremen in numerous instances commented on the skill and ease with which women adjusted themselves to drilling. A truism seemed to be, the women are as good as men at drilling.

Milling-machine operators.

The progression in machine operating for women appeared often to be from jig drilling to sensitive drilling, and then when the operator had attained skill in sharpening and changing her drills, if she worked in a production shop she might be upgraded to the operation of a milling machine. Sometimes girls coming from defense classes had been placed directly on milling machines. A smaller number of women were seen on milling machines than on drill presses. Girls loaded the machines and some were setting up the work to blueprints and checking with precision measuring aids. Milling machines usually are operated by easily manipulated button and lever controls. For light repetitive work of slotting, grooving, and so forth on small and medium-sized parts, women are well adapted.

Turret-lathe operators.

A somewhat smaller number of women were operating hand screw machines or small turret lathes (these machines are practically identical), making screws and small cylindrical parts that are needed in quantities but not sufficient to set up an automatic screw machine. Successive turning, boring, reaming, facing, and like operations are performed rapidly without removing parts from the machine and much of the work is repetitive. Set-up men adjusted the machines and tools for men as well as for women. The operation of hand screw machines or turret lathes on small work is not beyond the ability of women who have had enough experience or training to acquire some mechanical aptitude, a familiarity with the characteristics of metals, and cutting speeds.

Grinding-machine operators.

Small parts that had been machined on lathes, milling machines, planers, or shapers were further machined by women on magnetic chuck surface grinders and other rotating grinding machines. Women

grinders were able to follow blueprints, measure with calipers, micrometers, and scales, dress their grinding wheel if necessary, and generally follow work specifications. There were no large numbers of women on grinding, but foremen and instructors in training classes stated that light grinding was an especially suitable job for women and one with definite upgrading possibilities for those with experience on other machines such as drill presses and milling machines.

Miscellaneous machine operators.

Band saws, hack saws, nibbling machines, and profilers were operated by women in a few instances. Also, some women were using wire bristle wheels to clean metal parts or to remove scale, and were doing light polishing with rag (fabric-covered) wheels.

In a few plants making trainers where plywood is being used in place of sheet metal, women were employed on wood-working machines, sawing, sanding, gluing, nailing, and finally assembling the parts into structural sections of the plane.

All the plants that employed women on metal-working machines expected to assign more women to such work, and others were becoming accustomed to the idea of women on machine operations and were considering them for their factories.

BURRING AND FILING

A favorite introductory job for women is burring and filing in the machine shop and metal fabrications departments. Rough edges, small projections, and irregularities are removed from machined parts, fittings, casting, and sheet-metal parts with emery cloths, burring tools and files, the work sometimes being to close dimensions along scribed lines. Larger burrs or surplus metal are machined off on lathes and stationary grinders and the insides of holes are cleaned with burring attachments on drill presses. Many women were on bench burring and filing and as an entry job it afforded them training and experience in the use of hand tools and clamps, scribing, the handling of metals, and sometimes templates and machines, as well as breaking them in to the noise and work environment of the factory. Men have never been kept on burring jobs when opportunities for promotion came, and it is to be hoped that it will be considered an introductory job for women also.

SHEET METAL AND SUBASSEMBLY

Sheet-metal fabrication includes a wide range of jobs and a series of operations in all aircraft assembly plants, and most of the plants had women employed in the forming, reworking, and assembling of parts from sheet metal. Burring and drilling are common jobs here. Many parts are first formed on large drop hammers and a few women have been reported as assisting in the tending of these hammers and hydraulic presses—placing and taking off the parts. More women were observed on the hand forming or straightening of small parts over wooden blocks, using fiber or rawhide mallets. Women were forming curved sections on small rolling machines, were using hand and power brakes for bending, and were cutting sheet metal with hand snips and power shears. Women were employed only on the lighter forming, the smaller sizes of brakes, shears, and rollers. On light- and

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medium-sized punch presses they were blanking, forming, and piercing small angle brackets and fittings. Women also were scribing lay-outs from blueprints and templates for machining and assembling.

Operations preparatory to assembly, such as lining up in jigs and fixtures the ribs, spars, cowl flaps, struts, panel boards, tanks, and many other fittings used in the structure of the plane, included women in their number on both bench work and floor assembly. Women as bench workers using small jigs were forming subassemblies, fitting parts together with hand tools, wrenches, screwdrivers, scrapers, and the use of arbor or power presses to force the parts close together, drilling holes with portable drills, cutting with hack saws, inserting screws, clips, and dimpling by hand and machine.

Women were working with men on plexiglas parts for cabins and bomber turrets or compartments, laying out and scribing the work by the use of templates, heating the transparent plastic in special ovens, forming it over molds or in presses, and finishing and trimming the edges with band saws, milling machines, and grinders. After forming, the parts usually are covered with paper (masked) to protect the surface until the final assembly has been completed.

Riveting.

Riveting, the assembly operation that builds up most of the subassemblies and final assemblies, is the most publicized job in aircraft and the one for which much of the preemployment defense training has been given. One company contemplated taking on 2,000 additional women riveters. Women were engaged on the jobs concomitant with riveting—drilling, dimpling, inserting Cleco clips, and clamps for riveters—and as teamworkers were driving rivets with pneumatic guns and bucking rivets, operating one-shot and multiple stationary rivet presses, portable one-shot riveters, and squeezer riveters. Women were reported as shooting explosive rivets in spots that were difficult to reach with other equipment. Though not in large groups as yet, women were on all the varied types of riveting and not only were working on jig subassemblies of ribs, spars, and bulkheads, but were attaching the metal skin to the control surfaces and wing panels, and were crawling around inside and underneath the fuselage as riveters. Small women are found especially suited to riveting and bucking inside cramped spaces such as the empennage. Apparently riveters are always in demand and experience has shown that women can fill a substantial part of the labor force on this type of work.

Welding.

Women welders are not so numerous as women riveters. There are not so many jobs for welders as for riveters in aircraft, and a great deal of specialized training has been given and required for welders so that Army and Navy tests and standards can be met by the operatives. Private aviation fee-charging schools have enrolled women welders and public schools have trained women where employers have requested such training. Though the proportion was small, a few full-fledged women welders were seen manipulating acetylene torches and welding rods joining brackets to steel tubing on engine mounts, tanks, landing-gear parts, and other parts. A woman welder being paid a journeyman's rate of $1.32 an hour was reported as one of the most efficient in the group with which she worked; the others were men.

Parts plants making manifolds, cowls, airscoops, and tanks were employing women gas welders. Beginning women welders usually were started on tack welding—the temporary putting together of all parts prior to final assembly—and on welding parts not subject to strains that require the highest-grade welders.

Spot welding, a process that is substituted for riveting on an increasing number of assemblies, requires little training and women were being employed with marked success. A young girl spot welder who had more than doubled the previous production records of boys on the job was pointed out by one foreman. The spacing of the weld, the regulation of the pressure on the material, the welding time, and the flow of electrical current usually were reported as duties of leadmen but might be done by women if they are given the supplementary instruction needed and some knowledge of ohms law. Finger dexterity is helpful in spot welding and very little of the work requires heavy lifting. A few women who were spot welding and who talked with representatives of the Women's Bureau were most enthusiastic about their work.

Electric arc welding is replacing torch welding on some operations. No women were employed in the plants visited, but instructors and foremen reported that women could be used on the lighter operations if trained.

Splicing cables and swaging.

In the cable department of one plant several women were preparing assemblies of light cable, cutting to length, splicing, selecting the proper fittings, soldering, crimping, and operating swaging machines that shape and shrink the ends of tubing, and pressing metal fittings on the ends of cables. Two women who were working in the cable department in one plant were interviewed. They were cutting cables and swaging. Before their present jobs they had been in more usual woman-employing industries—stores and restaurants—and found their present work less tiring and much more interesting. One of them said that her foreman had considered splicing too hard for women, but she had watched the men and gradually was allowed to take over some of the work.

Electrical assemblies.

For many years electrical companies have employed large numbers of women on bench jobs doing precision assembly, so it was to be expected that among the first occupations deemed suitable for women in aircraft production would be some of those in the electrical workrooms. Jobs that women were working on were the assembly and preparation of electrical systems by cutting wires, attaching fittings and lugs with screwdrivers, arbor presses, and soldering wire to contact points; laying out wires on routing boards or jigs, bending them around pegs until a complete harness is assembled, and then lacing groups of wires together with wires, strings, and tapes, shellacking a protective covering, installing them in flexible conduits, soldering on lugs, and attaching designations for the final assembly into the plane.

The wiring and assembly of switch, junction, jack boxes, and work on the instrument panels were other woman-employing operations. Illustrative of the work done by women in these departments are some

of the operations that comprise the assembly of the instrument-panel board. The sheet-metal panel, junction box, name plates, instrument supports, valves, electrical connections, reinforcing angles, shock mounts such as rubber cushions, and other components are brought together. Parts may need slight reworking to secure an accurate fit of brackets, boxes, and fittings, and women were grinding, burring or filing, reforming with mallets any surface irregularities, and drilling and preparing additional holes needed for alining with the jigs and templates. Holes were alined in the various parts, and instruments such as the altimeter, tachometer, and turn and bank indicator, with their supports, were fastened in place with clamps, screws, bolts, and rivets. Fittings such as metal tubing, hose, valves, switches, knobs, and handles were attached according to specifications, and the women were using pliers, hand and pneumatic wrenches, peens, and other light tools. Short lengths of tubing were threaded into valves, indicators were adjusted, and pressure lines tested by women. The adjusting and checking of the instruments after the installation in the panel board was done by men in all plants at the time of the visit, but with training and encouragement for job progression, women could be developed who could do these more technical operations.

Most of the work in the electrical, radio, and instrument-panel divisions required manipulative dexterity of a high degree and the use of light tools. Much could be done at alternating sitting and standing work postures. In all ways it seems especially desirable for women and it is a type of work in which women's place should be assured not only for war but for normal production. Foremen several times stated that men had been "bored" by these jobs with a resulting high turnover or careless work.

Tubing.

A large bomber has thousands of feet of tubing for fuel, oil, oxygen, de-icer fluids, instrument and electrical conduits, and so forth. The inside of an aircraft wing or a fuselage is a maze of copper, aluminum alloy, and steel tubing. Women were being employed in increasing numbers on all the operations in the tubing departments. They cut tubing on hack saws; burred tubes inside and out; bent them by hand or machine for correct alinement to attachments; attached connectors, elbows, sleeves, unions, couplings, and so forth; flared tubing either by machine or by hand tools; cleaned, blew out, tested, capped, and marked it with identifying bands of different colors or color combinations to indicate its use and installation. In several of the large aircraft plants women were the majority group in the tubing department and were employed on all the operations that have been listed.

FABRIC OR COVERING DEPARTMENT

In most plants the fabric or covering department was the first to admit women, since a good share of the work is of a needle-trade character. Twenty-one of the twenty-three plants employing women had women on their fabric work. In one of the plants an assistant supervisor of the fabric department had sewed and stretched the fabric covering for the first planes turned out by this factory in the first World War. In most plants only the movable control surfaces are

fabric covered and in some even these are metal skinned, but in the trainer assembly plants wings and sometimes even the fuselage are still fabric covered. Cutting covers for control and other surfaces, taping the framework, machine stitching, stretching and pinning the covers to the framework, hand sewing the unstitched openings with close and evenly spaced baseball stitches, and rib lacing with long needles or rib staying the fabric fast to the rib structure by inserting flexible rods or special screws, are the usual occupations of women in the covering department.

In addition to the coverings for control and other plane surfaces, the fabric departments employed women to cut and sew a variety of covers for special accessories. In bomber plants women were making the lay-outs, using blueprints and templates and cutting various kinds of soundproofing and insulating materials such as stone felt, Dry Zero, kapok, and asbestos, taping, and inserting fasteners and grommets. For large transport planes and bombers women were making canvas curtains, upholstered pads, cutting and finishing carpets and other upholstered and fabric accessories. In at least a couple of instances women were observed as they cemented or glued the soundproofing to the interior fuselage surfaces, trimming edges to secure an accurate fit and pressing the material to the airplane skin according to specifications. Women also cemented insulating covers on steam lines, hot-air ducts, and other pipe lines or tubing.

The general competence and productive skill of women in the fabric or covering department seems to have been demonstrated sufficiently so that their place in this type of work is accepted without comment and is largely taken for granted. Much of the work requires dextrous fingers and strong hands. Considerable skill is required for lay-out work and the guiding of electric cutters on heavy materials.

PAINTING AND DOPING

Up to the time of the survey only about one-third of the plants employed any women in their doping and painting divisions. Masking—the covering of parts with tape, paper, or special coatings as a protection during painting or against damage during installation—was one of the most common jobs for women in the paint shop. Women were loading belts for machine painting, hanging small parts on racks for spraying and removing and inspecting them when dry. Insignia, numerals, and other special designations were sprayed on with the use of stencils or by applying decalcomania transfers, and occasionally women were employed for this. There were, also, a few women reported on brush priming, cleaning of painted surfaces, peeling off and removing masking, and doing any touch-up painting needed with small spray equipment.

Applying dope to fabric surfaces to make them taut and waterproof was done by women in a few plants, but usually was limited to extra coats of dope brushed over the tape reinforcements on ribs of the control surfaces.

An entry job for women in the paint and plating departments was the preliminary cleaning of small parts and surfaces to remove grease or other substances that would affect the adhering.

HEAT TREAT, ANODIZING, AND PLATING

Women's jobs in the heat treating, anodizing, and plating operations were few in number and limited in duties. The numbers employed in these departments are small and there are probably few desirable jobs for women. Often ventilation is a problem because of steam, heat, fumes, and smoke from plating and anodizing baths and furnaces. Burns from splashing hot liquids, chemicals, and furnaces are a hazard and sometimes toxic, and a considerable share of the work entails heavy lifting. The only jobs on which women were observed were the cleaning of small parts, stringing them together with wire pins, hanging them on racks, covering threaded parts with special coatings such as asbestos cement, unracking, and assisting with tending small furnaces for the heat treating of rivets, quenching, drying them on centrifuge machines, and then storing them in refrigerators.

FINAL ASSEMBLY

The proportion of women on the major fuselage and wing and final assembly lines was very small. Most plants had no women on these lines. In a couple of plants, however, women were working underneath and alongside slowly moving assembly lines installing pulleys, pulley brackets, pedals, levers, radio tables, seats, switch panels, controls, and fastening bonding strips and cables in place temporarily for final fastening by the rigger. Some of the women pushed themselves along with the plane on small rolling platforms, installing the parts assigned to their section, and then rolled back to the next plane on the line.

Women were assisting in the installation of tubing, taking off caps that had been placed to protect the tubes from dirt and foreign particles, blowing out the lines with compressed air, and attaching the tubing to fittings inside the fuselage and wing sections. Another job on which a few women were assisting was the installation of engine cowls, fastening cowling parts with Djus fasteners, and checking and adjusting ventilating flaps.

Women were noted also as working in a group or team installing parts of the hydraulic system for landing gears, fitting valves, cylinders, threading wire through nuts and bolts, and putting in final place other light parts of the hydraulic mechanism.

Mounting fittings and accessories as power-plant assemblers was the only work on which women were noted in the installation of the engine in the airplane. Final installation of plexiglas cabins, fitting and gluing soundproofing to the interior of the fuselage, and screwing, bolting, or riveting small accessory fittings and furnishings in the interior were reported as occasionally done by women. Workers on the final assembly lines need considerable all-round ability in using all types of hand tools, following complicated blueprints, for a variety of operations and working in close collaboration or teamwork with others on the line. As more women gain experience in the subassembly and fabrication division, their employment on the final assembly line will become increasingly feasible.

INSPECTION

Women inspectors were employed in at least one-half of the plants. They were engaged chiefly in the checking to order specifications of incoming purchased parts such as valves, rivets, bearings, and clamps. Threads, angles, and tapers were measured and gaged by women. Women inspected small parts and castings for internal defects, operating Magnaflux testing equipment. Testing the hardness of metal on Rockwell, Brinnell, and scleroscope testers required close attention to detail and constant repetitive work. Foremen stated that men were apt to become bored with this type of work and that women had proved much more satisfactory on the inspection of all kinds of small venders' goods. In the course of inspection women used all the usual types of inspection aids, micrometers, calipers, scales, and gages.

During the fabrication, forming, and assembly, inspection is continuous along with the processing. Women were employed on inspection in departments where they constituted a substantial part of the group, such as the fabric, electrical, and tubing sections. Also, in the paint, heat-treat, and plating departments, women were inspecting small parts and stamping or otherwise designating parts that met the required specification. Numbers to designate parts for assembly and replacements were put on by stamping or stenciling, electric etching needles, or machine or hand marking tools.

STORE ROOM AND TOOL ROOM

Store and stock rooms had women employees in the majority of the plants visited. Supplies such as sheet metal, extrusions, bars, clamps, nuts, bolts, rivets, and parts are kept in bins and on shelves and racks. Many of the parts to be stored and issued are small and can easily be handled by women. Much of the work is of a semiclerical nature, keeping stock records of the receipt and disposal of parts, perpetual inventory reports, filing requisitions and orders.

Similar jobs were held by women, and more could be held, in the tool rooms, where tools, templates, small jigs, and dies are stored, maintained in condition, and issued. Only a small number of women were found in the tool rooms, but in all cases where there were women it was planned to augment their numbers. If women had a more general mechanical background and knowledge of the names and uses of tools, more might be considered as desirable tool-crib workers. One firm estimated that it might use almost 300 additional women tool-crib attendants and clerks if labor supply conditions made it advisable.

OTHER JOBS

In one firm women were learning gage building. One girl was working on an electric strain gage and her job involved the threading of tiny hairlike wires. Deft fingers and the ability to work with painstaking accuracy on small details were attributes praised by the supervisors.

Girls in San Diego were receiving training in plaster-form making and it was expected that before long some women would be employed as assistants on plaster-form and template making.

Miscellaneous jobs on which some women were observed or reported were chiefly of a service nature in the factory, such as elevator operators, sweepers and janitors, oilers, operators of interdepartment electric trucks for transporting parts, office and factory messengers on foot and on bicycles—in one case called "rover" girls. One plant recently reported the use of women as police guards. None of these are significant in mass job possibilities but they suggest the many-sided types of women's present activities.

FACTORY CLERICAL AND NONPRODUCTIVE JOBS

Factory clerks in aircraft plants in normal times were almost all men, and at the time of this study men still were the preponderant group. As would be expected, women are steadily coming into the factory clerical jobs as substitutes for men in larger numbers, but the influx seemed to be chiefly in the typing, stenographic, and general factory clerk activities. A small number of women were employed as production clerks in planning and control divisions but preference still was for men. Few women were timekeepers. Experience has demonstrated that women can serve as stock- and tool-room clerks, as has been noted, and more may be employed as the labor market is further depleted of men. With the increase of women on the force, it seems a natural sequence that the number of women in personnel administration should increase.

Training courses have been established to train women as scientific and engineering aides. A few women engineers—an average of less than one to a plant—were pointed out, and an occasional woman was making architectural or prospective drawings of new plane models and parts. Drafting aides—tracers and letterers—had a few women representatives. Women with some engineering training or mechanical-drawing ability and a mathematical background were reported as possibilities for engineering aides to draw diagrams for parts. In the weight-control and stress-analysis divisions of engineering, many mathematical computations are made and a few women have been admitted to the ranks, but many more women who have a background in mathematics and short courses of special training in aerodynamics should find opportunities for war-production jobs. Girls who in their schooldays had a flair for descriptive geometry, trigonometry, and graphic projection methods should be useful in lofting.

SUPERVISORS

Supervision of women by women in the aircraft plants is still a moot question. Management often tended to shy off when questioned about the policy toward and possibilities of women supervisors with a statement that women prefer to be directed by, and work better with, men bosses. A few women supervisors were found in fabric divisions and as leadwomen in electrical, small assembly, and inspection, and these were reported as satisfactory. Most women have as yet not had enough experience in the industry to be in a position to take supervisory jobs that require a proficiency in the work of their department and an all-round knowledge of the processes involved. When women have longer work histories, it seems certain that women as well as men can

direct the work of groups. Women who seem likely supervisory material should be admitted to training classes for foremen.

Women counselors as a part of the personnel staff had been appointed in some of the plants to deal with advisory, counseling, and disciplinarian problems of women employees and to serve as a clearing house for special problems and grievances of the women and foremen. In some plants matrons were stationed in rest rooms to prevent loitering and to discuss work problems and advise the girls. These women were not employed in the capacity of maids but more as counseling aides.

PLANS FOR FUTURE EMPLOYMENT OF WOMEN

All the plants visited expected a steady growth in the number of their women employees and the production activities assigned to women. As already stated, the plants that did make estimates of the numbers of women they anticipated employing indicate an increase that may result in at least six or seven times the numbers employed early in 1942.

Most of the plants had no definite formulated plan by jobs as to the numbers of women they might employ in the coming months. One company, with two major assembly divisions, had analyzed by department and plant the jobs suitable for women and the numbers that might be employed, and this plan may be considered illustrative of future woman-employing trends in aircraft assembly plants. Women already were employed in many of the departments but the proportion was considerably under 10 percent. The woman-employing plan of this company was based on its job patterns and employment at the beginning of 1942. Over 12,500 jobs—almost one-third—were considered suitable for women, and a company official reported that both the numbers and the proportion of women to be added might be increased if labor-supply needs required.

Jobs for women were listed in most of the major departments, such as machine shop, metal fittings, sheet metal, precision and detailed assembly, hammer and press, trim shop, heat treat, paint and finish, fuselage assembly, wing, empennage, and final assembly, inspection, tool crib, stock rooms, engineering, experimental, dispatching, intraplant transportation, production and material planning, timekeeping, personnel, service, and maintenance. Two hundred or more jobs were considered suitable for women in each of the following departments: Sheet metal, electrical, tubing, miscellaneous subassembly, fuselage, wing, empennage, final assembly, heat treat, tool crib, storeroom, production control, production planning, and engineering. Machine operators, assemblers, inspectors, and clerks were scattered throughout the departments. In the wing, empennage, and final assembly, suitable jobs for over 3,500 women were reported, and the jobs included machine operations, detail assembly, drilling, dimpling, riveting and bucking, spar and frame building, fitting skins, airplane plumbers and riggers, installers of tubing, cowling, power plant, soundproofing, and so forth. Most of the jobs—almost 2,500, or one-fifth of 12,500 jobs—were as riveters. In sheet metal and subassembly, women were being considered for all sorts of detailed and precision assembly, drilling and riveting in all phases, filing and burring, etching, operating numbering machines, spot welding and welding helpers, press operators, and others,

most of which jobs have been commented on in the preceding pages. More than half of the jobs planned for women were related to riveting and detailed and precision assembly.

A number of more unusual jobs listed for women were airplane riggers, airplane plumbers, millwrights, template makers, weight computers, material estimators, plaster-pattern makers, and instrument testers.

TRAINING

Company officials in the aircraft industry were not enthusiastically disposed to favor preemployment training for women. Many stated that the bulk of the jobs in their plant to which women were being assigned or would be assigned required no previous training, though they had sponsored and subscribed to preemployment training of men for some of the same jobs. Somewhat grudgingly, however, they admitted that in practice women with preemployment training were given preference when applying for jobs. In most localities public defense schools, too, have not been allowed until recently to admit women to aircraft courses unless their training was sponsored by a defense plant and reasonable assurance of placement of female trainees was given. Fee-charging schools, some undoubtedly good but others very poor, are not restrained by such provisions or scruples and have advertised extensively for women to be trained for riveting, welding, and other sheet-metal work. Many women who desired to train for aircraft have been victimized by high fees and poor training, while some training facilities in public schools in early 1942 were idle because of a scarcity of male trainees.

At least such jobs as riveting, welding, operating some of the machine tools, and precision inspection require definite and closely supervised training whether given in preemployment classes or on the job under foremen and leadmen. Most companies have too few supervisors and facilities for specialized instruction, and much time and material can be wasted in haphazard training of new employees.

In most of the regions where large aircraft plants have been located, few women have worked in the metal industries, and women in general have little acquaintance with tools, properties of metals, and precision tolerances. They are at a disadvantage as regards background and experience when compared to the average man who goes to work in a metal shop. The nomenclature of the shop is a new vocabulary to the girl worker. Terms such as brazing, dolly, contour, dope, fin, oil can, rib, strut, thimble, arbor, punch, dimple, rouge, and so forth have quite different meanings in the factory from those in everyday life; for example, "oil can" signifies a buckling of the metal. The noise, interruptions, and work demands in a production shop often make instruction difficult. Women undoubtedly need more training than most men and recognize this need. Instructors in defense training schools state that women bombard them with questions, are much more meticulous than men in following detailed instructions, are less likely to slur over and pass up specifications, and demand more attention on their training projects. There are many adherents of the idea that women should be given a few weeks of orientation in general shop practice, an introduction to shop mathematics, interpretation of blueprints, measuring tools as micrometers, scales, and calipers, basic principles on the

properties of metals, shop terminology, and some preliminary experience with machines and assembly. Instruction on the job is still necessary but it is much easier for both worker and foreman if a foundation for shop work has been laid by preemployment training in either the factory or a vocational school, and women themselves fit in better if they know how their job fits in with the scheme for the finished airplane.

Several communities in California and a few other States have good public defense training courses available to women and the number of applicants outnumbers the training positions. Many courses have been opened to women for the first time in the spring of 1942. One training set-up for women that seemed especially good was that in the public National Defense classes in San Diego. Twice as many women as men, just over 600 women, were receiving preemployment aircraft training, and a larger number had completed the courses in sheet metal, machine shop, electrical assembly, welding, and inspection. Almost all the trainees who had satisfactorily completed their training had been placed in local aircraft assembly plants, parts plants, or the local naval air depot.

All women enrolled for shop work were given basic instruction in the handling of tools, some knowledge of metals, lay-outs, interpretation of work orders, blueprints, and training in one or more fields to fit them for a definite job as a machine operator, a riveter, a general sheet-metal worker, or a precision assembler.

A course in plaster-pattern making being given to a small group of girls was an innovation, and though at the time of the visit to the San Diego school no girls had advanced far enough for placement, the principal felt that there would be opportunities in local factories for those who completed the course.

Another new course in this school was one for engineering clerks. Girls with some college education and a knowledge of algebra, geometry, and trigonometry were given preference. Trainees in this course were working from blueprints with slide rules, using and working out mathematical formulas, and calculating amounts and weights of materials to be used, and were being prepared to work in engineering offices as weight-control clerks and materials computers.

Reports in the late spring of 1942 announced that Vocational Education for National Defense (VEND) in San Diego expected to train thousands of women for local aircraft factories in the present year.

The Engineering, Science, and Management Defense Training (ESMDT) offered by colleges throughout the country was beginning to offer courses to women as preemployment training for subprofessional jobs in engineering and scientific work, for drafting assistants, for precision inspectors, and for production-control clerks.

Under United States Civil Service certification, women as well as men are being enrolled as mechanic learners for placement in Government air depots as civilian mechanics. Instruction to student trainees is given in National Defense training centers for the following airplane crafts: Engine mechanic, propeller mechanic, instrument mechanic, radio mechanic, electrician, sheet-metal worker, welder, painter, leather or canvas parachute worker, wire worker and cable splicer, hydraulic mechanic, and woodworker. Courses as outlined in California offered from 320 to 600 hours' training. Certified train-

ees are paid $75 a month while in training and at the end of their training will be assigned as far as possible to work at a depot or subdepot within the area from which they are appointed.

While all courses, according to the Civil Service announcement, are open to women, women at first are being directed to the parachute, fabric, sheet-metal, radio and electric work, and gas-welding courses.

Supplementary training.

Supplementary training and upgrading classes were open to women and some had enrolled for blueprint reading and machine operation. As women are upgraded they should be encouraged and advised in the taking of special supplementary training on the same basis as men. Plans for Job Instruction Training (JIT) should give special attention to the needs of women.

RATES OF PAY

Women are entering most of the aircraft plants on the same pay scale as men. The job and work done, rather than sex, is the standard advocated by the War Production Board, the Army, the Navy, and the United States Department of Labor. Beginning rates ranged from 30 to 65 cents an hour for men and women. Twenty of the twenty-three plants had a uniform entrance wage for men and women, the most usual, 60 cents an hour, being reported by 14, 65 cents by 2, 55 cents by 2, 50 cents by 1, and 30 cents by 1, the last a small and relatively unimportant plant making a trainer type of ship. Of the 3 with wage differentials based on sex, 2 started men at 60 cents and women at 50 cents, and 1 started men at 55 cents and women at 50 cents.

All 9 aircraft assembly plants visited in California had the same entrance rate, 60 cents an hour, for men and women, with a progression of 5-cent steps at 4-week intervals until at the end of 12 weeks 75 cents was reached, the lowest rate for regular unskilled workers. At the end of the 12-week period workers are assigned the rate agreed on by collective bargaining or established by management for the job.

In New York, 2 plants had beginning rates of 65 cents an hour and 1 of 60 cents for women; in Kansas, 2 of 60 cents and 1 of 50 cents for women; and in Pennsylvania, 1 plant started women at 60 cents an hour, 2 at 50 cents, and 1 at 30 cents. In 4 plants in Texas, Tennessee, Ohio, and Missouri, 1 fell in the 60-cent entrance group, 2 in the 55, and 1 in the 50. For 22 of the 23 the range of beginning rates for women was from 50 to 65 cents; the 1 small plant with a 30-cent beginning rate had a production-bonus system and the rate specified was the lowest guaranteed hour rate, with actual hourly earnings considerably higher.

At the time this study was made, women's work history in the aircraft industry was not long enough to have hourly earnings that had progressed much above the beginning rate. The average hourly earnings for women usually were less than 75 cents. Only nine plants reported that the prevailing rates for women averaged 75 cents or more.

The highest-paid woman reported in the shops was a welder receiving $1.32 an hour. The next highest were two women in covering

departments at 98 and 95 cents. Twelve plants reported maximum rates paid to women ranging from 80 to 98 cents an hour. Since women were still novitiates in the industry, their rates were not typical of the wage plans for women. By the summer of 1942, it is to be expected, many more women will have reached the higher levels in the aircraft wage structure.

A new aircraft plant in the Midwest has announced its minimum rate for all productive workers—no sex differential—as 95 cents an hour. A few of the job rates for occupations on which large numbers of women will be employed are: $1.10 for light assembly; $1.10 to $1.20 for inspection; $1.15 to $1.30 for filing and burring; and $1.10 to $1.15 for punch-press operating.

Work on the second and third shifts was compensated at rates somewhat higher than the day rates. Five and six cents additional hourly usually was paid, and the third or "graveyard" shift often was a short one, 6½ or 7 hours, paid for as 8 hours with the additional 5 or 6 cents for the actual hours worked.

Most employees, both men and women, were working more than 40 hours a week, and in accordance with the Fair Labor Standards Act received time and one-half for hours worked in excess of 40. Most women were working 48 hours and on the day shift, and on this basis, at a 60-cent beginning rate, their week's earnings would be $31.20; at 75 cents, $39.

HOURS OF WORK

Most of the women in the aircraft assembly plants, as just explained, were scheduled to work an 8-hour day and a 48-hour week, 19 of the 23 plants having such a schedule. One plant had an 8-hour day and a 40-hour week, 2 had a 7½-hour day and a 45-hour week, and 1 had some of its women on a 10-hour day and a 57-hour week.

Four of the 9 States in which plants were visited (California, New York, Ohio, and Pennsylvania) had State hour laws for women workers limiting the daily hours to 8 in manufacturing; in 4 others (Missouri, Texas, Oklahoma, and Kansas) the limit was 9 hours, and in 1 (Tennessee) it was 10½. The statutory weekly hour regulations for women in manufacturing were 48 in California and New York, 44 in Pennsylvania, 45 in Ohio, 49½ in Kansas, 54 in Missouri, Oklahoma, and Texas, and 57 in Tennessee. The States with weekly limits of less than 48 hours had issued emergency permits to individual plants for longer hours when need of relaxation of hour standards for war production could be shown.

Of all the workers, men and women, 60 percent were on the day shift, 30 percent on the second or evening shift, and only 10 percent on the third shift, in the early months of 1942. All the plants had two or three shifts for men—18 had three shifts and 5 two shifts for men—with considerably more men on the first shift. In 10 plants all shop women were working on the first shift, in 11 plants women were employed on two shifts, and in 2 women were employed on all three shifts but with relatively few on the third shift. Most of the women were on the first shift.

Men's scheduled hours usually were the same as women's but there was greater irregularity in the hours of men and overtime in excess

of their daily and weekly schedule was reported as occurring frequently.

Lunch periods usually were 30 minutes for the first and the second shift, but men on the third shift often ate on duty or had a 15-minute rest period. In some of the plants women were allowed to leave their work places 5 minutes earlier than the men to avoid the rush and stampede out of the shop at quitting time.

PERSONNEL REQUIREMENTS, POLICIES, AND PRACTICES

Preemployment examinations.

In the aircraft industry as in other war production all employees are required to bring proof of their citizenship, to be finger printed, be cleared with the Federal Bureau of Investigation, and have their former employment and references checked. In all the large plants physical examinations are required.

In selecting women employees a number of firms were aided by giving mechanical aptitude tests, ring and pin-block types of tests, and other standardized tests. In some of the aircraft communities the United States Employment Service was administering aptitude tests for all employers requesting them, and had devised tests especially adapted for some of the more common woman-employing occupations. A number of California firms that had availed themselves of this testing service were most enthusiastic about women who had been referred to them as a result of this sifting process. Other firms were very definite in their opposition to such testing. Intelligence and personality tests were used by a few firms and one firm in particular felt that such tests had enabled them to select an especially desirable group of employees.

Age.

Most of the plants reported a minimum hiring age of 18 years but usually made the qualifying statement that preference was given to women over 21 and often added that women from 25 to 40 years were preferred. Upper age limits were not definitely admitted, and women in their fifties or even sixties were pointed out, but actually the older and middle-aged women were a small group. Aircraft being a new industry has been one of young workers and the average age for both men and women has been under 30. The most usual average ages reported for women ranged from 26 to 28 years and for men the average was even less, which has resulted in serious inroads by the armed forces and has caused a revision of age standards and a stimulated interest in the employment of women.

Marital status.

Prejudice against the employment of married women was rare in the aircraft assembly plants. A number of plants preferred women with dependents, on the ground that they were more stable in their job relations. When women were first inducted into the aircraft industry, a number of firms instituted special employment policies based on family relationships. Some stated that they would hire only the wives and daughters of men employees, hoping by this policy

to lessen housing congestion in their area and to alleviate transportation difficulties by having family groups transported to work together in a family car. Also, if postwar recessions require reduced personnel, it was planned that one or more of a family might be laid off without taking away all wage-earning support of the group

On the other hand, some would not employ husbands and wives or near relatives in the same plant, and others would not employ them in the same department, fearing that shop discipline might be affected or confidential production secrets be more easily revealed outside the plant by members of family groups. Only one firm, however, reported definitely that they would not hire married women, and in that plant women who married while in the company's service were allowed to stay on. Wives of men in military service, and in California the widows of Pearl Harbor, often were given special consideration and employment priority.

In general, as more women are added to the working force and as the available supply of labor dwindles, less attention is given to policies of employment based on family status and most employment discriminations of this nature are fast disappearing.

Actual figures were not available on the marital status of women but estimates made in a number of plants indicated that slightly less than half (35 to 50 percent) were married, about 30 percent were single, and the remainder came from broken family groups—widowed, separated, or divorced women. One firm reported that about two-thirds of their women employees were responsible wholly or partially for the support of children.

Uniforms and work-clothing standards.

War-production girls in natty uniforms with firm insignia have made good newspaper and magazine pictorials. Actually most of the firms were not requiring definitely stipulated types of work clothing for women any more than for men, and stated that they were opposed to such regimentation and were merely requiring that women be safely and suitably dressed for work. Such requirement usually recommended slacks and simply made shirts or blouses, with short uncuffed sleeves loose-fitting enough to be comfortable but not so loose as to catch in machinery. Low-heeled shoes with a closed hard toe were recommended for comfort and as a safety measure. Rings and jewelry around moving machinery are dangerous and were discouraged; a bracelet or ring caught in a machine may mean the loss of an arm. Heavy hair nets, bandannas, or caps often were required of all girls working on or near machinery, as stray curls caught in a whirling machine may mean a scalping as well as the loss of hair. Several of the companies had prepared printed suggestions and instructions for women's work clothing that were presented to each new female employee.

Several plants, in some cases at the request of the women themselves, had approved company uniforms for women, which were sold at the plant or at local stores. In a few instances the wearing of the company uniform was required, and when required there usually were repercussions on the part of some of the women, especially of women who had been employed in the fabric divisions before the present emergency and felt that there was little need or glamor in such regimentation.

Typical of the types and cost of required uniforms were the provisions of one large aircraft company that had arranged for a local merchant to sell three types of garments, the cheapest a blue-denim coverall sold at $3.50, next a two-piece shirt and slack cotton-gabardine suit for $5.50, and for those who desired a finer work suit, a shirt and slack suit of closely woven rayon and better workmanship at $8.95. The last named was suitable only for the cleaner jobs, such as factory clerk and some of the inspection where the worker is not exposed to oil, grease, and dust, or cuts from sharp edged tools. Whether or not required, the women usually wore slacks, low-heeled shoes, and some protective hair covering.

Goggles or plastic eye shields were required for women on the same jobs on which they were required for men, and almost all the women who were welding or were grinding, polishing, or operating other machines from which particles of metal fly out were observing this precaution. Some of the firms furnished goggles and shields as company equipment.

Tool kits.

Tool kits of workable hand tools as required for the job must be provided by the women as well as the men. Tools needed vary, of course, with the job. Drill-press operators, welders, spray painters, some of the inspectors and others do not furnish their own tools, but the majority of the workers do so and women must expect and be willing to furnish the same job equipment as men. The machine operators on machines such as lathes, hand screw machines, milling machines, and grinders usually furnish calipers, small micrometers, scales, steel rules, scribers, ball-peen hammers, trammels, a variety of wrenches, and so forth. Bench assemblers, final assemblers, and precision assemblers also must own such tools and usually in addition several types of pliers, center punches, and cutting snips.

Labor unions.

Fourteen of the 23 plants in which women were production workers had union open-shop bargaining agreements with organizations affiliated with either the A. F. of L. or the C. I. O., 8 with the former and 6 with the latter. Of the 14, 13 had the same beginning rates for men and women, which were 60 cents an hour in 8 plants, 65 cents in 2, 55 cents in 2, and 30 cents in 1 small plant; the last named had an incentive system of payment, on a production-bonus basis, and 30 cents was the lowest guaranteed hourly rate, with higher actual earnings. One plant—an A. F. of L. plant—had a sex differential with the lowest or beginning hourly rate for men 55 cents, and that for women 50 cents. Of the other 9 plants, 7 had no collective bargaining for wages and 2 had agreements with independent unions. Beginning rates followed the same pattern as in plants with collective bargaining; 6 had entrance rates of 60 cents for both men and women, 1 had 50 cents for both, and the 2 remaining had a 10-cent sex differential, men starting at 60 cents and women at 50 cents.

Of the 3 plants with no women shop workers, 1 had an A. F. of L. agreement, 1 an agreement with an independent union, and 1 no agreement. The beginning wage was 50 cents an hour in the first and 60 cents in the other two. In the 13 plants with A. F. of L. and C. I. O.

affiliations having the same entrance rates for men and women, when the workers, regardless of sex, had completed the learning period they were to be paid the rate for the job.

In a number of the cities union representatives reported that though women were new in their organizations their numerical representation in proportion to the number employed was as great as that of men. Women in aircraft are serving on grievance committees, and at least one was representing her fellow employees as a delegate to the local central labor council. Unions accept the induction of women into the plants when the pay is based on the job and not on sex, as then they need have no fear of wage cutting by women.

WORKING CONDITIONS

The aircraft plants are new, with good lighting, good ventilation, and new equipment, usually with the latest safety devices. Since most of the plants were built with no plan for women, toilet and dressing rooms in some cases are inconvenient and inadequate. Even some of the new buildings still in process of construction were giving little attention to special toilet and restroom facilities for women. Girls employed on jobs that can be performed while seated sometimes sit on boxes and makeshift chairs. Difficulties of getting chairs and equipment for rest and toilet rooms even with war-production priorities often were given as the reason for inadequate facilities. As more women are added, most of the plants are in need of additional and more convenient toilets and restrooms.

Food service.

Provision of food during the lunch period is needed to safeguard the health, morale, and efficiency of workers. Many workers have no facilities for preparing lunch and are dependent on the food service provided by or near the plant. Most of the aircraft assembly plants had company provision for serving food during lunch periods or there were rows of private lunchrooms, hot-dog stands, and carts just outside the gates. Cafeterias and lunchrooms provided by the plant were in some cases so far removed from the shops and the lines were so long that with a 30-minute lunch period workers could not use these facilities. In a number of plants the use of lunch wagons—some of them practically rolling steam tables or ovens that could be plugged in at any electric socket—brought plate lunches, soup, sandwiches, desserts, hot and cold drinks into the factory. In one plant 3,500 employees were served in about 5 minutes by 17 lunch wagons. A choice of two lunches, one at 21 cents and one at 26 cents, provided an entree (meat or fish), vegetables, dessert, and milk or hot drink. Another plant reported that 24 new lunch wagons were more popular than the cafeteria. Lunch wagons that go through the plant and carry lunches often mean that workers have no respite from their workplace, and to alleviate fatigue and secure as much restoration of physical energy as possible during the lunch pause there should be adequate and convenient restrooms with chairs or couches where a few minutes' relaxation is possible for those who feel the need of it.

AIRCRAFT SUBASSEMBLY AND PARTS PLANTS

In the United States as in England there is an increasing dispersal of the aircraft industry, the large aircraft assembly plants developing extensive subcontracting programs with firms normally engaged in all varieties of manufacture. Ten such firms, employing from 140 to 6,400 persons on aircraft subassemblies and integral parts of airplanes, were visited in California, Kansas, Missouri, Tennessee, Ohio, and Pennsylvania. These plants for the most part manufactured sheet-metal subassemblies such as wing sections, ailerons, flaps, elevator and rudder tabs, exhaust engine manifolds, cowling, shrouds, and air scoops. A few made oil tanks, gas tanks, pilot seats, firewalls, engine mounts, engine fittings, and bomber turrets. As the Women's Bureau continues its studies, more plants of this type will be visited. At this time it seems advisable to make a brief report on the employment of women in the 10 plants covered.

Two of the ten plants employed no women on productive operations, and in 7 of the remaining 8 the percent of women employed was less than 10, the average being 5 percent. The remaining plant slightly exceeded 10 percent. The 2 plants employing no women had no immediate plans for using them. Three plants knew a larger proportion of women would be employed but had no idea what the ultimate number might be because this was contingent on the duration of the war and the availability of male workers; the other 4 plants were in the process of hiring many more women and it was variously estimated that women might comprise from 30 percent to 70 percent of the employees when peak production was reached.

Five of the eight plants employing women had the same minimum beginning rate of pay for men and women, the rates being respectively 55, 56, 60, 65, and 69 cents an hour. In two plants there was a 5-cent differential in the beginning rates for men and women, and in 1 a 10-cent differential. Six of the eight plants were operated on a 48-hour-a-week basis. In two plants women worked on all three shifts, in four they were on two shifts, and in the remaining two on one shift.

Two firms were making stainless-steel manifolds. One employed over 100 women on acetylene gas welding and the other expected to have this many or more. In the plant first named all the women had gone through the company training school for welders, completing their training in from 3 to 6 weeks, and had passed the Army-Navy welding test and were certified class A, group 2, welders; for the other firm women had been trained in the local National Defense training school and were paid 51 cents an hour while in training. The Army inspector in one plant who had given women the welding tests found that they were more proficient than men on this lighter type of stainless-steel welding, and both firms planned to train many more women for welding because of their superior workmanship. Many of these women had no previous industrial experience and formerly were waitresses, teachers, and office workers.

There was the greatest prevalence of women on sheet-metal fabrication, bench work, and subassembly, all of which are interrelated and similar. They were filing and burring parts in the press and forming

departments, and forming and straightening parts with hand mallets, frequently accompanying this with the use of scales to check contour curves and angles. In connection with assembly of parts into small bench jigs and fixtures there was much hand and machine burring, use of electric and pneumatic hand drills, hand peening, use of arbor presses, and gun, squeezer, and machine riveting. All this work lends itself well to the employment of women and in most of the plants an ever increasing amount was to be done by women.

Women were assisting in the final assembly of wings, tail surfaces, and control surfaces into the larger floor jigs, fitting and clamping ribs, spars, beams, stringers, and so forth, fastening skin with Cleco clips, using electric and pneumatic hand drills, and riveting and bucking rivets.

In plants making fabric-covered control surfaces and wings women were performing the usual operations of power-machine work, hand and rib stitching, and stretching fabric over the framework. In some of the paint departments women were laying out parts on racks for spray painting and others were brush-painting primer coats on fabric surfaces.

In some of the machine shops women were being used on small and medium-sized drill presses and small hand screw machines. Women also operated punch presses and did spot welding. They were found commonly on both process inspection and receiving inspection, checking parts visually and manually with all types of gages, scales, and Rockwell hardness-testing machines, and checking parts against requisitions and blueprints. Other nonproductive operations on which women were employed were as blueprint-machine operators, blueprint file clerks, tool-crib attendants, production clerks, stock-room clerks, and as draftsmen and tracers.

These woman-employing occupations are precisely the same as found in similar departments of the airframe assembly plants and the proportion of women employed is closely parallel. There is an even greater opportunity for women's employment in the subassembly plants because the parts and plane sections are so much smaller, and because specialization in production has given rise to a breaking down of operations entailing much more repetitive work, which women can learn quickly and easily. The aircraft subcontracting program is just gaining momentum, and within the next 6 months to a year will come into prominence as a major field of employment for women in war industries.

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, Secretary
WOMEN'S BUREAU
MARY ANDERSON, Director

Women's Employment in Artillery Ammunition Plants, 1942

By

MARTHA J. ZIEGLER

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Artillery Ammunition plants included in this report

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Name of plant	Location
Arkansas Ordnance	Jacksonville, Ark.
Carter Carburetor Corp.	St. Louis, Mo.
Century Electric Co.	St. Louis, Mo.
Coosa River Ordnance	Talladega, Ala.
Dura Division of Detroit Harvester	Toledo, Ohio
East Coast Naval Ordnance	Burns City, Ind.
Elwood Ordnance	Elwood, Ill.
Hercules Powder	Dublin, Va.
Hoosier Ordnance	Charlestown, Ind.
Illinois Ordnance	Carbondale, Ill.
Iowa Ordnance	Burlington, Iowa
Kingsbury Ordnance	Kingsbury, Ind.
Landis Machine Co.	St. Louis, Mo.
Lone Star Ordnance	Texarkana, Texas
Louisiana Ordnance	Minden, La.
Mississippi "	Flora, Miss.
National Fire Works	Elkton, Md.
National Fire Works	Cordova, Tenn.
Naval Fuse Loading Plant	Macon, Ga.
Ogden Ordnance	Ogden, Utah
Picatinny Arsenal	Dover, N. J.
Ravenna Ordnance	Ravenna, Ohio
Redstone Ordnance	Huntsville, Ala.
Savanna Ordnance	Savanna, Ill.
St. Louis Steel Corp.	St. Louis, Mo.
Triumph Explosives	Elkton, Md.
Wolf Creek Ordnance	Milan, Tenn.

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Women's Employment in Artillery Ammunition Plants, 1942

INTRODUCTION

Earlier survey.

In the spring of 1941 agents of the Women's Bureau visited two Government arsenals to study the occupations involved in the making of artillery ammunition. Processes used in the manufacture of metal components, projectiles, and cartridge cases were studied, as well as those that are necessary in the assembling and loading of parts and complete rounds of artillery ammunition. Powder-bag making and loading and the manufacture of certain types of powder pellets were included in the survey.

Following these visits, descriptions of the occupations in which women were engaged, and suggestions concerning operations being performed by men on which women could be used, were published in a bulletin entitled "Employment of Women in the Manufacture of Artillery Ammunition." While women were found to predominate in departments where small parts were being assembled and inspected, it was evident that they could be used more extensively on various machine operations requiring relatively short periods of training and on certain additional kinds of jobs. On operations requiring the handling of projectiles or cases, it appeared that the possibilities of employing women more extensively were somewhat limited because of the size and weight of many of these objects. Therefore, it was felt that women's work could be expanded mainly on the smaller shells and cases, such as those of the 37-mm. or 75-mm. sizes.

Scope of recent survey.

With the development of the defense program, and the rapid progress under a condition of actual war, many artillery ammunition plants have been built and others are still in the process of construction. Consequently, in the period from November 1941 to April 1942 a much wider survey was made, covering a very large proportion of these new plants, to determine the occupations in which women actually were being employed. In contrast to the two arsenals first visited, however, none of these plants is engaged to any appreciable extent, or will be so engaged, in the manufacture of metal components or other metal parts. Therefore, the occupations considered in this recent survey were confined to those involved in the making and loading of powder bags, or in the assembling and loading of shells and cartridge cases, and of small parts such as fuzes, boosters, primers, and detonators. One or two of the plants included in the survey

were making a somewhat wider variety of products, but occupations not directly related to artillery ammunition have been omitted from this report.

A representative group of plants, including several bag-loading establishments, were visited. Practically all these are new plants situated in the eastern, southern, and middle-western parts of the United States. Most of them are owned by the Government but operated privately, while a few are new or recently expanded Government arsenals or depots. The majority had begun to operate, though in a number of cases only partially, at the time of visit. The others were expecting to begin production soon.

Number of women.

Estimates as to the number of women these plants expected to employ at peak production were obtained from plant and Government officials, but such estimates were subject to revision with changes in circumstances, in production methods, or in other factors. Though the estimates given at the time of visit may prove to be too high in some instances, in others it is possible that they may be revised upward, especially as three plants were visited prior to December 7 or very shortly thereafter. Officials of a number of companies indicated that their original estimates concerning the proportion of workers who would be women have been raised from time to time, particularly since the outbreak of war. For instance, in three plants that had planned to use 35 to 40 percent women, the female labor requirements have been raised to 60 or 70 percent of the total.

However, on the basis of the best data available it seems evident that the proportion of women to be hired out of the total labor force in these plants depends largely on the size and type of the ammunition to be loaded. All the bag-loading plants, for example, expect to use a high proportion of women, ranging from 54 to 70 percent. Officials of two plants designed primarily to assemble and load fuzes, primers, and other small parts expect that 80 to 90 percent of the employees will be women. In the shell-loading plants, the number of women who can be used will depend mainly on the size and weight of the shells and bombs being loaded. Of all the plants visited, two Government depots probably will employ less than 20 percent women in their peak labor forces. However, neither of these plants is designed to confine its operations exclusively to the loading and assembling of artillery ammunition. In five plants it was estimated that probably 30 to 40 percent of the employees will be women. In all the others the officials interviewed said that more than half of the employees will be women, and in 10 of these plants it was stated that women will constitute about two-thirds or more of the labor force.

The plants already operating had more than 25,000 women employed at the time of survey. The estimates of these plants concerning anticipated employment indicate that approximately 80,000 women will be at work when the plants reach peak production, and most of them expect this peak by late summer or early fall of 1942. In the plants not yet in production it was estimated that 20,000 women eventually will be employed. Therefore, the total anticipated by all the plants at maximum production is 100,000 women.

All these figures concerning women employees include office workers and a few other groups of women, negligible in numbers, such as nurses, cafeteria workers, and matrons, not employed in the operating and producing parts of the plants. However, the great majority of the women are employed, and will continue to be, in shop operations, that is, in the actual assembling, loading, inspecting, or packing of ammunition. At the time of visit there was a wide range in the proportion of women office workers to the total women employees of each plant, but from the estimates of anticipated employment it would seem that in most plants this group will comprise not more than 10 percent of the woman labor force.

Other matters of inquiry.

It was apparent at the time the visits were made that there was variation from plant to plant in the types of work on which women were being employed; in several instances women were seen performing an operation in one plant that in another plant was being done solely by men. As this indicates that the employment of women can without doubt be extended to additional jobs in a good many plants, an effort has been made to describe all the chief types of shop or "factory" operations on which women were seen engaged, or about which definite information was obtained. While it was not possible to compile a complete catalog of all the dozens of small steps in operations on which women were employed, and normally would be employed, and while some operations may have been omitted, it is believed that the principal types and varieties of jobs, and those most typical, have been included.

Since this report is designed as a supplement to the earlier bulletin of the Women's Bureau on the employment of women in artillery ammunition, no attempt is made to describe here, except in very general terms, the products customarily included in artillery ammunition. The emphasis is placed on the work actually being done by women.

It is recognized, of course, that there are hazards involved in working with explosives, and that these are serious in connection with many jobs in artillery ammunition plants. In addition to the danger from explosions, workers are subject to dangers from poisoning or infection in working with various toxic substances, such as trinitrotoluene (TNT), tetryl, and lead azide. Some individuals have been found also to develop skin infections from working with cleaning fluids, or even from handling metal parts. Attention was given, therefore, to general working conditions and to provisions for safety in the plants visited, but no attempt was made to analyze thoroughly the health hazards involved in working with different kinds of powder and chemicals, a highly technical subject that for a long time has been a matter of study by Government experts.

In addition to information concerning occupations, and general working conditions, statements were obtained from plant officials concerning the numbers of women employed, the requirements for hiring, wage systems, scheduled hours and shifts, training, and other personnel policies.

OCCUPATIONS

The occupations in which women were engaged in the loading and assembling of components have been discussed separately from those in which they were working on lines where shells, depending on their sizes and types, were being loaded and assembled with cartridge cases, windshields, fuzes, fins, or other components and increments. The smaller varieties of shells usually were being assembled with all other necessary parts to make complete rounds of ammunition ready for firing. There was a noticeable difference in the proportion of women being employed on fuze lines, or lines handling other components, and shell-loading lines. Some plants were handling both types of product, but in others only components were being loaded and assembled, these to be shipped later to other plants to be combined with projectiles. Further, there seemed to be some tendency in the industry to differentiate between the two kinds of products, and the United States Army *Ordnance Safety Manual* states that "fuzes, primers, boosters, primer-detonators, and similar loaded components form a distinct class of ammunition when they are not assembled to or packed with projectiles." [1]

Powder bags are essential increments of rounds of semifixed and unfixed (separate loading) ammunition. Since the operating plants making and loading these bags were found to be highly specialized and devoted entirely to this kind of work, the occupations in which women were employed in these plants also have been considered separately.

Components.

Because of their finger dexterity and patience in working with very small parts, women are rather generally considered particularly adept at the operations required in the loading, assembling, inspecting, and packing of different types of components, such as percussion elements, primers, boosters, booster cups, detonators, fuzes, and the many varieties and sizes of these. In fact, as might have been predicted from the first Women's Bureau survey of the industry, a high proportion of the employees found in this general type of work were women. A number of lines engaged in such operations were visited, and in some instances two-thirds or more of the employees were women.

However, it was not possible to visit all such lines in all plants, and in any case it would be impossible to describe all the operations in complete detail. Probably hundreds of different kinds of small operations are necessary to complete all the many types and varieties of components. Furthermore, exact processes, or steps in processes, vary somewhat from plant to plant, though many operations are actually quite similar, differing from one another only slightly. It is possible, therefore, to describe the principal types of operations in general terms. Also, a number of examples, illustrative of the different kinds of work being done by women in the plants visited, have been included to indicate the nature of the operations performed.

[1] U. S. Army, Office of Chief of Ordnance. Ordnance Safety Manual. U. S. Government Printing Office, Dec. 1, 1941, p. 112, sec. xvi, par. 133a.

Loading.

In a broad sense the term "loading" can perhaps be considered as including all the operations essential to the assembling of components in their final form to make a complete round of ammunition. However, loading is here considered in a narrower sense as consisting primarily of the operations quite directly related to the filling with explosives of various small parts, such as percussion elements, relay elements, booster cups, and detonators.

Generally the plants included in this survey were confining their operations to the loading and assembling of ammunition and were not manufacturing powder. However, in some instances several chemical substances were being mixed to make certain types of powder. Even in instances where men were making or mixing powder, no women were doing this type of work. In a number of plants, though, powder pellets, used most frequently in the loading of components, were being made. Usually these were made of black powder or tetryl, and here again most of the operatives were men. In one plant, however, women were operating the press machines to make black powder pellets, while men were doing the heavy work of handling the bulk powder. Each press was in a separate room, with a door equipped with a safety device so that it could not be opened while the machine was operating. After setting a press the woman operator left the room and turned a switch on the outside of the wall. Operations could be watched by looking at a mirror, placed so as to reflect the action of the machine, through a peephole in a thick wall. Each woman was responsible for the operation of two presses.

More women, however, were engaged in putting pellets, already made, or powder, already mixed, into various small parts. In this work quite a number of men also were employed. Lead azide, fulminate of mercury, tetryl pellets, and primer mix, which is a combination of several chemical substances, were the types of powder being used most commonly by women in these loading operations. Some women were inserting tetryl or black powder pellets in containers. This in itself is not difficult, though it is necessarily hazardous and, in the case of tetryl particularly, there is danger of infection or poisoning against which certain precautions are necessary.

Women were engaged also in loading percussion elements for primers. In one type of operation women were placing empty percussion cups in plates for filling and were then rubbing black powder over a brass plate perforated with holes through which powder was sifted into cups. A few women were being employed in tending foiling machines, which stamped out disks of shellacked red paper and pressed them over the powder cups. In another plant women were doing practically all the work in a section where percussion elements were being loaded with primer mix. With the use of tweezers one woman was picking up very small paper disks and weighing them on a fine scale to be sure that only one disk at a time was being used. The next woman in line was putting a drop of shellac in each primer "housing" or cup and inserting a disk. After one or two other small operations women were putting the wet primer mix in the cups. Then, after the covers had been placed over the cups, each one was inserted

under a press. Women were operating the presses. The excess primer mix was then wiped off and the completed elements were placed in trays to dry.

Several lines were visited in which women were engaged in various operations which are necessary in the loading of detonators. They were weighing powder, generally lead azide or fulminate of mercury, and using tiny ladles to load it into cups. Sometimes more than one kind of powder was used in detonator loading and then the charge was consolidated by means of a press. The powder used in detonators is highly explosive and can be set off suddenly, so each operator doing the loading was working behind a barricade containing a glass panel. However, in order to do the loading the operator ordinarily must insert one hand and arm behind the barricade. Throughout the detonator lines, in fact, barricades were being used, where possible, around presses used for crimping and between the different compartments where employees were working. Usually a number of men also were employed on these lines, sometimes on the most hazardous operations and sometimes to manipulate the presses requiring a fair amount of physical strength.

In the first survey made by the Women's Bureau's agents at two Government arsenals, it was found that men usually were employed to do the work of crimping the loaded detonators in presses and of ejecting them from sleeves or jigs used. However, in the plants visited more recently this was not uniformly true. Some women as well as men were operating presses on detonator lines. In one line visited, for example, women were operating all the kinds of presses being used and a woman was operating the final or "knock-out" machine that ejected the completed detonators.

Assembling and inspecting.

In connection with all loading operations, a number of women were employed in performing small assembly-line jobs, such as inserting disks in cups prior to loading or placing covers on loaded parts. Such jobs did not require the direct handling of explosives, but were being done in close proximity to loading operations. Some inspection also was being done along these lines.

In many instances women were working in rooms where various small parts, already loaded, were being combined and assembled into complete components. Some of these small loaded parts, such as percussion elements or detonators, came from other parts of the same plants, while others were received from outside. Women were being employed for virtually all the different kinds of operations on these lines. This is natural, because of the type of work required. For example, women were engaged in such jobs as the sorting of small pieces, the inserting of disks, washers, springs, or wires into metal cups or containers, the screwing together of different small parts, and the placing of tiny pieces in holes or depressions in parts of somewhat larger size. Also, women were employed in cleaning off excess paint in empty primer bodies. Some assembly work required the handling of inert materials only, that is, materials containing no explosives, but other work was being done with parts already loaded. Near the end of the assembling processes women were engaged in such operations as applying lacquer to stake marks, or glue or shellac to various parts of completed units, usually to make them waterproof.

Many of the women employed in assembly work were performing all the necessary operations with their hands, though a few were using hand tools, such as tweezers, wrenches, or files. However, a good many women were operating various kinds of presses, particularly for crimping or staking operations. Some of these were manipulated by hand levers, while others were operated by air pressure applied by foot pedals. Barricades often were found around these presses. Some pneumatic screw drivers and power drills also were handled by women.

At many stages during the assembling, as well as the loading, of fuzes, primers, or other components, inspections are made. The many small parts necessary for a complete fuze, for example, must be assembled in exactly the right way so that the fuze will be sure to function properly and at the right time. Parts received from other plants are inspected at the beginning of operations. Sometimes completely assembled fuzes, except that they are unloaded, are received from other plants, and these must be disassembled as well as inspected.

Women were doing practically all preliminary inspection and a great deal of other visual inspection in looking for surface defects. In a few instances magnifying glasses were being used. Women were using micrometers and various types of gages to check the dimensions, as well as scales to check the weight, of parts and completed assemblies. In two plants women were seen testing primer bodies for holes by sitting in a completely darkened room and holding the bodies over a small electric light bulb. In many cases arming machines also were being operated by women. By the use of such a machine it is possible, for example, to test a fuze to see whether it will operate when it revolves at a certain number of revolutions per minute.

Naturally there is considerable variation in the exact sequence of operations in assembling and inspecting all the many different types of fuzes, primers, and other components, but a few examples of operations seen may be mentioned. In one plant where a delay-action type of point detonating fuze was being assembled, women were engaged in putting into the plunger body a relay (a small aluminum cylinder filled with lead azide), a delay (a pellet of compressed black powder), a delay washer, a primer, and a primer cover. On this particular line each woman inserted all these parts in the plungers that she assembled. In the next operation centrifugal pins and springs were inserted. Then women assembled the firing pin, containing a plunger support and a plunger retaining spring. In a later operation the lock pin was inserted and crimped into place by use of a press.

On this same line another series of operations was being performed by women assembling the fuze heads. The metal heads were inspected for defects and gaged to be sure that they would fit properly with the firing pin. Detonators and detonator cushions were then inserted in the heads and a retaining screw was put on with a pneumatic screw driver and then staked by a press.

In still another operation slider tubes were being gaged to be sure that the threads had been made properly and then tensioned and staked into the body of the fuze. After the smaller parts were all assembled, the head and ogive of each fuze were tensioned and staked to the body, and then the completed fuze was gaged for over-all height and all stake marks were shellacked.

Similar types of operations were carried on by women on other lines where boosters were being assembled. Women were placing rotors in booster bodies by the use of tweezers. Onion-skin disks were being placed over the rotor covers by women. Some women were screwing the cups containing tetryl to the booster bodies by hand. Others were tightening these cups to the bodies with wrenches, and then the cups were staked to the bodies. The completed units were passed under an over-all gage and given a final inspection.

Packing.

At the end of all the assembly lines for components a number of women were engaged in packing operations. In some instances each completed fuze was first placed in an individual cardboard container. Smaller parts were being packed in boxes and women were employed in taping these boxes and dipping them in wax to make them waterproof. Women were employed also in stamping or stenciling information concerning the kind of fuze, primer, or booster contained in a package, the lot number, and any other essential data on the containers. Usually final packing of components is done in boxes of fairly large size, and men generally were doing all this work, since it is too heavy for women.

Shell loading and complete rounds.

A number of the plants visited were engaged in loading shells with explosives and in assembling them with components and other parts. Shells of the 75-mm. or 3-inch sizes, as well as smaller ones, usually were being made into complete rounds of fixed or semifixed ammunition ready for firing. The projectiles were being assembled with loaded cartridge cases, fuzes, and other necessary parts; for example, windshields in the case of armor-piercing shells. Projectiles to be used in trench mortars were among the types being assembled and on these fin assemblies were attached to the shells rather than cases containing propelling charges.

In unfixed (separate loading) ammunition, such as shells of the 155-mm. size, normally the propelling charge of powder bags and the fuzes would be packed separately from the shells and the final assembling would be done at the time of firing. Generally, work on shells of these sizes appeared to be considered too heavy for women, and for the same reason women were not employed to any appreciable extent on lines where bombs were being loaded. In fact, with a few exceptions women were employed generally on lines where shells of the 20-, 37-, and 60-mm. sizes were handled.

Partly because of the fact that different sizes of shells were being loaded in different plants, there was considerable variation from plant to plant in the type of work women were doing. But there was also variation in the occupations on which women were employed in plants loading some shells of very similar types.

In one plant, for example, women were engaged in scooping powdered TNT into cups, weighing it, check-weighing it, and pouring it into 60-mm. shells. The powder was then pressed tightly into shells by machines operated by men. In another plant, however, in which the same size of shell was being loaded on one line, men were performing all these operations. The weighing and pouring of powder, which women were doing in the one plant, requires no special physical

strength but is hazardous, and precautions against infection from TNT are necessary. Precautions should be observed also, of course, when men are employed.

Actually women were employed to only a minor extent in the loading of shells. In addition to pouring some powdered TNT, women were performing a few small operations in several plants on shells being loaded with a tracer charge. The women were dropping pellets into the shells, usually on top of the powder charge, to form tracer and igniter charges, and some were placing celluloid covers over the finished charges. Some women were operating presses to press down the powder in the shells, but men also were performing this part of the operation in some plants.

On the other hand women were being employed generally to load cartridge cases with propelling charges. Smokeless powder for fixed ammunition was being weighed and check-weighed on shadowgraph scales. Women were doing this work and also pouring the powder into cartridge cases. In one plant it was noted that women were performing this series of operations in groups of three.

In semifixed ammunition a number of plants were employing women to tie powder bags into cartridge cases. The first bag in a group was fastened over a hook in the base of the cartridge case, and the other bags in the charge were then placed in the case on top of this bag.

Women were performing a number of operations involved in the inserting of primers into the bases of cartridge cases. Arbor presses were used to press the primers securely into the cases, and women in some instances were operating these presses on cases of the 20-mm. and 37-mm. sizes. In one plant it was reported that women placed the primers in the cases but the presses were operated by men. However, at the time of the previous survey it was found that men were doing all the assembling of the primers into cartridge cases,[2] so apparently the employment of women has been extended to this type of work rather recently.

Women were employed in several other miscellaneous occupations common in the assembling of shells. Though practices varied from plant to plant, women were employed in at least one plant, and sometimes in several, on each of the following operations:

Removing grease and dirt from empty shells.—Women were seen using an air-pressure tube to clean shells as they passed on a conveyor belt. In a plant where men were doing this sort of work, officials said that women could perform the operation if they did not have to lift the larger shells.

Putting metal bands or tape on the threads of shells.—This was done to protect the threads while the shells were passing through a paint-spraying machine. Women were doing this work on shells of 20- and 60-mm. sizes. Some women were also taking off bands and tape and inspecting shells after paint-spraying.

Inserting fuzes in loaded shells.—A few women were being employed to do this as the shells moved along an assembly line. Women did not need to lift the shells and in at least one plant a few women were being used at times on a line where shells of the 75-mm. size were being assembled.

[2] U. S. Department of Labor. Women's Bureau. Bul. 189–3. Employment of Women in the Manufacture of Artillery Ammunition (1941), p. 15.

Assembling cartridge cases to shells.—In one plant women were crimping together the loaded cartridge case and shell of the 20-mm. size.

Shellacking the seams where projectiles and cases join.—Women were doing this on some of the smaller sizes of projectiles.

Staking fins and fuzes to shells.—Women were cleaning fins and operating pressing machines to stake the fins and fuzes to shells. In some instances men also were doing the latter operation.

Inserting propellant increments in fins.—Women were fastening sheets of smokeless powder into fins.

In addition to these operations women were doing some inspection of shells moving along assembly lines, and occasionally were retouching with a paint brush shells that had not been properly covered by paint-spraying machines.

Women were stenciling data concerning size, type, lot number, and other necessary information on the sides of shells and packing containers. In some cases smaller shells were being packed into individual cardboard containers by women, but the packing of shells together into larger containers, and most other work in the packing departments, was done by men. Without doubt much of this work would be too heavy for women.

Bag loading.

Three of the bag-loading plants visited were already in operation and women were being used very extensively for work in both bag-making and bag-loading departments. In only one plant, however, were they employed on the first important operation, which consists of cutting the pieces for the bags. This work is very similar to the work of a cutter in a clothing factory, and involves the use of an electric power machine to cut through many thicknesses of cloth at a time. In the company where women were employed on this work they had been trained within the plant.

Women almost exclusively were being employed for the other jobs in the bag-making departments. Much the largest number, of course, were sewing pieces of bags together on power sewing machines. The small pieces must be sewed together carefully and securely, with seams of the proper kind, and a small opening must be left in each bag so that it can be filled with powder. Some women in these departments were operating the printing presses used to stamp lot numbers and other necessary data on pieces of the bags before they are sewed together. A good many women were trimming and counting the bags after the sewing had been done, and still others were inspecting the completed bags very carefully. Some inspectors were using rulers to measure seams. Work in the bag-making department is not hazardous, since customarily this part of a plant is considerably removed from areas where explosive materials are used.

In the bag-loading departments the work is, of course, more hazardous, since powder, and bags loaded with powder, must be handled. One plant was not using women in these departments, but the other two were using women extensively and a plant not yet operating was planning to do so. Women were working in small groups, weighing powder, check-weighing it on shadowgraph scales, and pouring the powder through a funnel into the small openings left in the powder

bags. Then these openings in the bags were closed by women operating sewing machines with bronze needles. Women in another department then inspected and trimmed the loaded bags, and other women assembled and laced them together according to specifications. While more women were working on lines where smokeless powder was being loaded into bags, some were working on lines where bags were filled with black powder, a more hazardous type of work.

In all bag plants men were doing the heavy work of bringing powder from storage houses to the loading buildings and of pouring the powder into hoppers. Also they were doing the heavy packing at the end of each assembly line.

Miscellaneous occupations.

A few women were foreladies, assistant foreladies, supervisors, and instructors in the bag-loading plants visited, and in a few other plants there were some women supervisors. One plant had a group of 20 who had been specially trained so that they could instruct other women as they were hired, but such an arrangement was rare. In the great majority of plants not only the top production officials but also the line foremen and assistant foremen were predominantly men, even in departments where most of the workers were women. Of course, most of the women had been employed only a few months in most of the plants, in some instances only a few weeks. Further, due to the nature of the industry very few women had had any experience in ammunition prior to the construction of the new plants, but it appeared that many more men than women had been given an opportunity to take the necessary preliminary training to fit them for supervisory positions.

There was a wide range in the number and ratio of women office workers. In about half the plants, more than 100 women were employed in office work. No particular investigation was made concerning the kinds of work these women were doing, but most of them appeared to be engaged in the usual clerical occupations, such as secretaries, stenographers, typists, general clerks, and office-machine operators. Some women were working in employment offices as receptionists, and in some cases as interviewers. In one plant it was stated that several women interviewers had had a considerable amount of training and did a specialized type of interviewing. In spite of the fact that large numbers of women were employed, or eventually would be, in many of the plants, comparatively few women had been taken on to do personnel work with women employees, but in a few instances there was a woman assistant to the personnel director or to the plant official in charge of recreation and welfare. In one plant it was noted that a trained social worker had been engaged as welfare director to give service to all employees.

Since first-aid and hospital facilities are necessary in ammunition manufacturing, professional nurses were found in all the plants. The total number of these was, of course, small. In each plant, also, some women were employed as cafeteria workers, laundry workers, janitresses, and custodians of women's washrooms and change houses, where the women put on plant uniforms. Because of the nature of the industry some women have specialized duties in enforcing safety regulations concerning the type of clothing that must be worn in the

plants and the change-house routine that must be followed. In one plant, for example, the change-house hostess and her assistants inspected the women workers each day to be sure that matches, jewelry, and other forbidden articles were not taken into the explosives areas of the grounds. In some other plants such inspections were made at irregular and unexpected intervals.

Future possibilities for women's employment.

As indicated earlier, the plants included in this survey expect to employ eventually about four times as many women as were employed at the time of visit. A good deal of this expansion was expected to come, of course, through the hiring of more women to operate additional lines as they were ready to begin production, and through the placing of operations on a full three-shift, 7-days-a-week basis. Therefore many women will be hired to do the same kinds of work on which others already are employed.

Further expansion of women's employment in the industry will come also as a result of the beginning of production in new plants. Many of these will handle products similar to those now being made and hence the jobs for women will be much the same. Nevertheless, products will vary somewhat and there will be some differences in jobs. In one plant, which was expecting to load a type of tube not being produced in any of the plants visited, women were to be hired to place onion-skin disks over the ends of the tubes, to stencil data on the outsides of the tubes, and to clean, inspect, and pack them. This work will be quite similar to other kinds already done by some women.

If the present trend continues, it appears probable that women will be used more generally in the future in some occupations on which employed in only scattered instances at time of survey. Many plant officials foresaw an eventual scarcity of male labor. Also, housing shortage and lack of transportation facilities were reported to be serious problems in many areas. For these and other reasons considerable interest was expressed in the possibility of extending the employment of women to other types of work, with a view to taking on more women who reside near the plants, including many from the families of individuals already employed.

In departments where components were being loaded and assembled, it would appear that women could be used for practically all operations except those requiring the handling of heavy boxes in packing departments, and it is probable that expansion of women's employment will occur in such departments. Particular consideration could be given to the possibility of using women more extensively to operate pellet-making machines or loading devices, especially when the machines are manipulated by turning switches and by watching operations from beyond walls or barricades.

However, on most lines producing components a high proportion of the workers already were women, therefore it is on shell-loading lines, and in the assembling of complete rounds of ammunition, that a relatively greater expansion of women's jobs may be feasible. For example, women probably could be used more generally to pour powdered TNT into shells of the smaller sizes. One official stated that he believed women could be used to operate the machines to press this powder into the shells, though his plant was not as yet

using women for this work. Also, since women were operating the presses to fasten primers into the bases of cartridge cases in several plants, presumably they could be used more extensively on this type of work. Even on shells of 75-mm., 105-mm., or larger, some plant officials thought that at least a few women could be used in the future. Such expansion would be dependent partly on the availability of men to do heavy lifting or the use of conveyors or other mechanical equipment that would make heavy work unnecessary.

A few Army officers and other plant officials discussed the possibility of using women eventually on other kinds of jobs on which women were not employed at the time of this survey. For example, the possibility was mentioned of using women in some operations on lines where TNT is melted and poured into shell cavities. Generally such work has not been considered suitable for women, as it involves considerable hazard, but, as has also been said, there is no reason to believe that women are less careful than men.

The opinion frequently has been expressed by persons in the industry that women usually prove more susceptible than men to skin infections and poisoning from TNT, tetryl, and certain other powders. Individual women vary in their susceptibility to such infection and some women might be affected only slightly or not at all. If in cases of emergency or serious shortages of manpower women are tried experimentally on operations of this type, care should be taken to provide suitable uniforms, bathing facilities, milk for drinking, and other precautionary measures known to counteract the effects of exposure to various types of explosives.

It was reported in several plants that consideration was being given to the employment of a woman in the personnel department to take care of the problems of women workers. A report was received from one plant that a woman assistant to the line superintendent would be employed to look after the workers.

While this survey was concerned primarily with the work women actually were doing in connection with plant operations, and to some extent with the possibilities for their future employment in additional kinds of work, it was noted incidentally during plant visits that a considerable number of men were employed in office work. The possibilities of employing women in more of the office jobs were not discussed with plant officials but a few volunteered the opinion that a higher proportion of women would be employed in the future. In a number of plants, for example, young men were employed as reception clerks and interoffice messengers, but in one of the last offices visited it was noted that women were doing this type of work.

TRAINING AND GENERAL PERSONNEL POLICIES

Training.

Because of the nature of the artillery ammunition industry very few experienced women could have been available to work in the plants included in this survey. Moreover, officials of practically all the plants stated that no experience was necessary, and even the bag-loading plants, employing large numbers of power-sewing-machine operators, were hiring chiefly inexperienced workers. Some sewing-machine operators, however, had received preliminary train-

ing through the WPA or NYA, and other workers may have had some general shop or factory training in NYA or vocational-school classes prior to employment.

In most of the plants officials indicated that the jobs women were performing required no great amount of instruction, and the female workers were being trained within the plants after employment. Frequently Army officers and other Government employees had assisted in the setting up of training programs. In one plant it was noted that representatives of a State department of education were studying training needs, with a view to establishing a training program, probably a supplementary course, in a plant that was shortly to begin operating.

In one city a course designed to give training particularly suitable for women desiring employment in a nearby ammunition plant had been established by a public vocational school. All women employed at the plant were taking this course, approximately four weeks in duration. The work covered shop mathematics, sewing-machine operation, machine-shop work, and training in the rapid assembly of a variety of washers, rivets, and wires. The most apt students were given additional training in micrometer reading and other special kinds of work. In another city a course to give preliminary training in fuze assembly and loading with inert materials was being planned by a vocational school.

It has been the general policy of these plants to send a small number of key people to one of the Government arsenals to be trained as foremen, supervisors, and instructors. These people have then trained the rank and file of the other workers. Usually classes have been set up several months before production has started on any large scale, and classes normally would continue as long as large numbers of workers were being hired.

A few plants reported that women had been included among those sent to Government arsenals for training. One bag-loading plant, for example, had sent 6 women, and one shell-loading plant had sent 20. In more instances, though, it was stated that only men had been sent to Government arsenals and that all women had been trained in the plants themselves.

An official of one bag-making plant stated that inexperienced operators work first on small bits of straight sewing in order to become familiar with power sewing machines. Later they sew the more simple parts of bags and they progress gradually to types of work requiring more skill.

Frequently it was reported that workers being trained to handle explosives are given preliminary training in their duties on inert materials. For example, powder bags might first be loaded with corn or beans. A worker might obtain practice in weighing small charges of powder on very finely balanced scales and in pouring the powder into metal parts of ammunition, by going through all the operations using sand instead of powder. Those working with inert materials are trained to follow the procedures and routines necessary in handling explosives. One plant had constructed a model line solely for practice purposes.

Safety education is, of course, one of the most important types of training given to workers in such an industry. In addition to the

preliminary work with inert materials, plants constantly instruct workers concerning safety measures, as well as various types of operations to be performed, by means of lectures and motion pictures. Special manuals and instruction books also are issued to employees.

No generalization can be made from the information obtained concerning the time required for training. This is due partly to differences in the degree of skill required for different jobs and to the amount of hazard involved. In some jobs the training period was said to be only two or three days. In more instances, though, 10 days, or two or three weeks, appeared to be considered necessary. The opinion was expressed in one plant that workers seemed to lose interest in their jobs if the training period with inert materials was longer than two or three weeks. Sometimes new workers are placed beside experienced workers to watch them for a few days before attempting to do much actual work with explosives themselves.

Rates of pay.

In the plants already in operation, minimum rates of pay for women operatives ranged from 40 cents to 65 cents an hour. In one-fourth of them the minimum was 40 cents, but in almost half the beginning rate was 50 cents or more. No definite statistics were available concerning the prevailing rates for women operatives in these plants. Since some plants had been operating only a short time, some officials thought most of their women employees were still on the beginning rates. Others said that a good many women had been advanced to higher rates. Time and one-half the hourly rates was being paid for hours worked in excess of 40 a week.

In a few plants there was a system of automatic advancement for plant operatives at the end of a stated time, usually one to three months. In a good many instances, though, personnel managers stated that advancement was on an individual basis as ability was shown. In one plant an entire group on a production line normally would be advanced together, and could advance several times at the rate of 3 cents an hour. However, in this plant, as is fairly common, a maximum rate for each type of work had been set. A number of plants have worked out detailed systems of job classification and each job calls for a certain rate of pay. Therefore if a worker becomes skilled enough to be advanced to a more responsible job, she automatically receives the rate of pay for that job.

Generally, where each job has a specific rate hazardous jobs carry a higher rate of pay than nonhazardous ones. Several plants reported a minimum rate for those working in hazardous occupations that was 3 to 5 cents an hour higher than the rates for workers in the inert-materials departments. Differentials for work on second and third shifts were not very common. One plant reported that 5 cents an hour more was paid for those shifts, and in another plant workers on the night shift were paid for 8 hours though they worked 7½ hours. In a good many plants shifts were rotated, which was one reason for paying no differential.

Reports were obtained in almost half the plants concerning the minimum rate for men operatives. In only 2 of these were women

and men started at the same base rate of pay, 56 cents in one plant, 60 cents in the other. In 8 plants the differential ranged from 5 cents to 20 cents an hour, and in half of them it amounted to 10 cents or more. It was explained by some officials that men and women were not employed to any extent on the same kinds of jobs, and also that sometimes a man had to be hired to do the heavy lifting for women workers. However, the opinion was expressed by at least one official that probably there was no real justification for wage differentials between men and women in certain productive operations. Expression was given also to the principle that if women were employed on the same jobs as men they should be given the same pay. It should be noted that some work being done by women, such as power-sewing-machine operating and the assembly of small parts, generally is considered unsuitable for men, yet these operations are as intrinsically important to the production of ammunition as the lifting and packing of heavy objects, done traditionally and necessarily by men.

Scheduled hours of work.

In the majority of plants the scheduled hours for women plant operatives were 7½ hours of actual working time a day. The overall time for each shift generally was 8 hours, with a lunch period of one-half hour. In some instances women were paid for this lunch period. Other plants had a scheduled workday of 8 full hours.

Two of the operating plants had 45-minute lunch periods; all the others but 2 had 30 minutes. The 2 exceptions had scheduled lunch periods of only 20 minutes but had short rest periods morning and afternoon. In a number of other plants rest periods of 10 minutes, and in one case of 15 minutes, were given twice a day.

The usual schedule for women was 6 days a week, making the normal weekly hours generally 45 or 48. However, because many of the plants were new, and most of them still were recruiting workers, certain irregularities in hours were reported. Though some women were working only 5 days a week, in 2 plants women had been working 7 days for some weeks. It was stated of the latter, however, that the practice was being followed because of an emergency and was not to be continued indefinitely.

Several of the operating plants were using some women on each of the three shifts, and the same number of others were employing them on two shifts. The remainder had women on only one shift. It was expected that many more women would be employed on second and third shifts as the plants approached peak production. Rotation of shifts was common and the most usual period of work on one shift before changing to another was two weeks, though two plants reported that shifts were being rotated weekly.

State laws concerning the working hours of women in manufacturing vary considerably in the States in which the plants surveyed are located. Three have no laws governing the weekly or daily hours of women workers. One State has a limitation of 45 hours a week and 3 others have laws providing for 48 hours. The laws of the other States permit a greater number of hours weekly. Three of the States have provisions limiting the hours of work to 8 a day, and in 4 the hours are limited to 9 a day. Only 3 of the

States have laws prohibiting or limiting the night work of women. Moreover, during the war emergency State authorities generally are issuing special permits or are making adjustments with respect to women's hours of work in specific plants engaged on war production where such arrangements are shown to be necessary.

Requirements for hiring.

In most plants the minimum age limit for women was 18 years; 3 were hiring no women under 21. In the beginning there apparently was a tendency to hire the younger workers, but over half of the operating plants reported no maximum-age restrictions for women. A number of women obviously over 40 were seen at work in some plants, but the majority probably were under 35. Most of the operating plants require physical examination prior to employment, which frequently includes tests of the heart, lungs, eyes, ears, and blood pressure; another plant was planning to give such examinations. The physical examination requirements probably tend to favor the younger group of workers.

There were no restrictions against married women as employees. No specific information had been compiled in the various plants, but a number of personnel managers estimated that probably at least half of their women employees were married. In some areas there was definite interest in recruiting more housewives from the nearby towns to work in the plants. This was especially feasible because of the absence of any necessity of previous experience.

Because of the character of the industry all workers in these ammunition plants must be citizens of the United States. Investigation of an applicant's previous employment record and general background and character is made in all cases by plant officials and members of the Federal Bureau of Investigation. Some application blanks call for many references, and fingerprints are taken of all prospective employees.

Food service.

Because of the large areas covered by these ammunition plants and the scattering of the buildings at considerable distances, the problem of providing hot food for the workers is difficult. A cafeteria near the administrative buildings is too far away from the production lines to serve the workers at lunch time except in a few of the operating plants visited. Eight plants had made some provision to get food to the production departments. In a few of these the central cafeteria was near enough to production lines to be used by all workers; where it was not, the plants had solved the problem by the erection of canteens in the shelter houses or in other buildings adjacent to the lines, or by transporting lunches to the workers by means of carts. Usually the lunch consisted of sandwiches and other cold dishes, but always hot coffee and in some cases such foods as soup were served. In the other plants it was stated that most workers were bringing their own lunches. Officials of several of these said that some consideration was being given by the companies to the possibility of erecting food facilities and of transporting food to the lines. Two plants apparently had given no particular consideration to making provision for serving any type of hot food to the plant operatives.

Uniforms.

Three-fourths of the plants already operating reported that some women employees were required to wear uniforms, and at least two others expected to have uniforms later. In a number of plants only those women on hazardous occupations, or in certain types of hazardous work, were required to wear uniforms. At the time of visit, women in bag-making departments generally were not wearing a uniform but some of them expected to begin this practice later. Two types of uniform were being used, some kind of washable slack suit and a cotton one-piece dress. For purposes of safety, slit pockets and rubber buttons were commonly used on these uniforms.

Some plants stated that employees' uniforms were provided by the company, but even in instances where the employees were supposed to provide their own, all laundering was done by the plants. This is really essential from the point of view of safety. Persons working in explosives departments are supposed to wear safety shoes; also, there are other safety regulations generally followed, such as stipulations against the wearing of metal hairpins and jewelry, or any other kinds of metal, in areas where such articles might cause an explosion.

General working conditions.

Special attention was paid during the construction of the new plants to the provision of certain facilities as aids to safe operation. All but 2 of the operating plants visited had new buildings, and 1 of the others was constructing a new plant while operations were continuing in its old buildings. The new buildings generally were clean, well ventilated, and well lighted. Fluorescent lighting systems were noted frequently. Obviously all buildings in explosives areas must be well built of noninflammable materials. These buildings are situated at considerable distances from each other for purposes of safety, and "shelter houses" or "bomb proofs" to which the workers can go in case of an electrical storm or other emergency are near the production lines.

The new buildings generally are provided with many exits. For example, in one rather typical building visited it was noted that there were doors near each end of every work table. The buildings usually were only one floor in height; but in instances where buildings had more than one floor, chutes had been provided down which workers could slide from the second floor in case of an emergency.

Other safety measures, not all of which can be mentioned in a brief report, are common. Much of the most hazardous work is done in very small compartments enclosed by thick walls or barricades so that an explosion is not likely to affect a large number of people. Placards announcing the number of persons and the maximum amount of explosives allowed in each particular room or compartment generally are posted in the buildings.

Because of the distances to be covered, transportation within and between the buildings is essential. Usually this appeared to be supplied by special buses operated by the plants themselves.

Hospitals, first-aid facilities, fire and police protection are essential in ammunition plants. All plants reporting had hospital facilities or

were constructing them. Nurses, doctors, and persons trained in first aid were available. Also, all plants but one stated that entrance medical examinations were required for workers; the other planned to require such examinations when its hospital facilities were completed. Some plant officials stated that periodic medical examinations were to be given, but complete information on this subject was not obtained.

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August 1, 1951

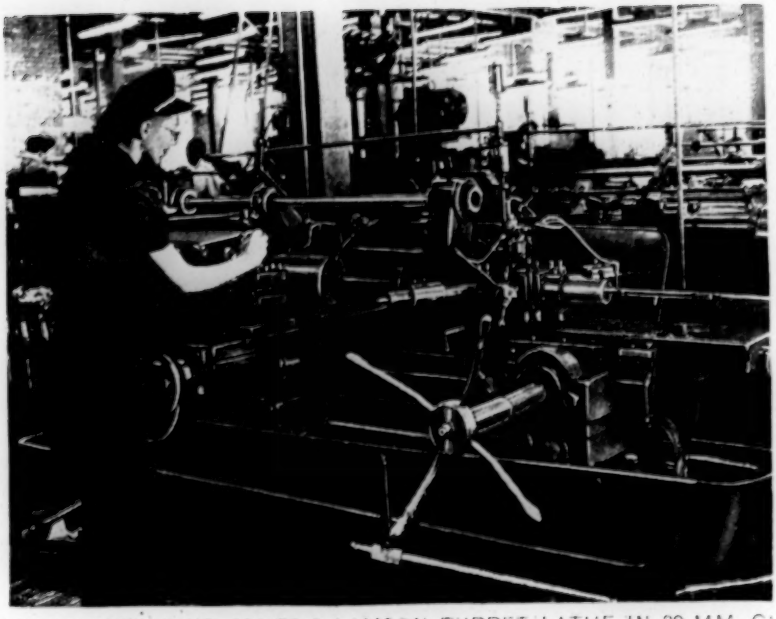
Plants included in ~~Study~~ Report -

Employment of Women in the Manufacture of Cannon and Small Arms in 1942

Name of plant	Location
Colt Patent Firearms	Hartford, Conn.
General Motors, A. C. Spark Plug	Flint, Michigan
General Motors, Frigidaire Ordnance Div.	Dayton, Ohio
Rock Island Arsenal	Rock Island, Ill.
Savage Arms Corp.	Utica, N. Y.
Springfield Armory	Springfield, Mass.
Watertown Arsenal	Watertown, Mass.
Watervliet Arsenal	Watervliet, N. Y.

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Burring, filing, and polishing	15
Assembly	16
.30-caliber rifles	16
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Assembly	25
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Inspection	26
Packing	26
Parkerize, heat treat, sandblast, barrel tumble, and paint	26
Factory nonproductive jobs	27
Tool room (tool making)	27
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WOMAN OPERATING JONES & LAMSON TURRET LATHE IN 20-MM. GUN PLANT. SIX-POSITION TURRET WITH A VARIETY OF CUTTING TOOLS.

Employment of Women in the Manufacture of Cannon and Small Arms in 1942

INTRODUCTORY

Earlier Survey in Canada.

A number of Canadian war plants making small arms and cannon were visited by representatives of the Women's Bureau in January 1942 to observe the role women were playing in wartime production. Before the United States entered the war Canada recognized the imperativeness of bringing women into all phases of the war program as her men were drawn off into military service. As new cannon and small-arms plants were established, women were taken on as an integral part of the productive force, though most of them had had no industrial experience as Canada was not highly industrialized. Many were put through quick training courses prior to placement on the various types of factory operations. In one rifle plant two-thirds of the factory workers were women, and plans in general were to use 60 to 75 percent women in small-arms and cannon manufacturing.

Survey in the United States.

A comparative study of the work women are doing in the United States and of the occupations to which their employment can be extended was made in small-arms and cannon manufacturing during the summer of 1942. Four Government arsenals and four private firms were covered in the States of Massachusetts, Connecticut, New York, Michigan, Ohio, and Illinois.

The layman considers the term "guns" to cover everything from revolvers to huge coastal defense guns, but in a technical sense "guns" includes only large-caliber cannon, while the terms "small arms" and "firearms" include small-caliber weapons. "Small arms" (firearms) include hand and shoulder weapons such as rifles, pistols, revolvers, shotguns, machine guns, and other automatic arms having a bore of 0.60 inch (caliber .60) or under. All weapons of over .60 caliber are classed as "cannon" or "guns," and these include howitzers, mortars, railway artillery, antiaircraft artillery, field artillery, naval guns, tank guns, and antitank guns.[1] Under the metric system the division is "less than 20 mm." and "20 mm. or over."[2] Though gun mounts, gun turrets, gun carriages, and so forth are included in the classification of "guns," this study does not deal with the manufacture of such related equipment but is confined to the manufacture of the actual gun itself.

[1] Executive Office of the President, Bureau of the Budget. Standard Industrial Classification Manual, Vol. I, Manufacturing Industries, 1941, pp. 38–39.
[2] Hayes, Col. Thomas J., Elements of Ordnance, 1938, p. 624.

In the arsenals visited there was a considerable amount of experimental and repair work on castings, carriages, gun mounts, tanks, cannon, and small arms, in addition to actual production. Two of the plants made cannon ranging from the small 37-mm. guns to large-caliber cannon such as the 16-in., 14-in., 12-in., 155-mm., and 105-mm. Another did much experimental work on gun carriages, gun mounts, and tanks, but also manufactured and repaired machine guns. One firm produced chiefly small arms but also a few small-size (37-mm.) cannon. The four remaining establishments manufactured only small arms, including Garand rifles, Springfield rifles, Browning machine guns (.30- and .50-caliber), Thompson submachine guns, automatic pistols, and shotguns. The arsenals and two private firms were old-line small-arms and cannon manufacturers, but two of the private firms had converted from completely different lines of commercial production.

The establishments covered ranged in size from 4,000 to 15,000 employees, with a total employment in all 8 plants of about 75,000, 11,000 (15 percent) being women. There was great variety in the extent to which women were employed at time of survey, the percentage of women among total employees in the eight plants being respectively 3, 6, 11 (2 cases), 14, 19, 23, and 30. Those with the lowest proportions had only recently taken on women, a condition resulting from differences in male labor supply in the areas, differences in degree of stringency on the part of local draft boards in granting occupational deferments, and differences in outlook on the part of management as to the feasibility of using women.

The arsenals employed women on a limited number of factory operations at the time of World War I, but none were employed in peacetime, as arsenal production and activities diminished greatly. Very often women had not even been retained in the offices of the arsenals, but during the last months of 1941 and the first half of 1942 office managers again turned to the employment of women. The two regular private small-arms manufacturers had employed a few women in peacetime on filing, burring, polishing, and punch-press operations but the number was less than 1 percent. The expansion in women's employment started in one plant in the middle of 1941 and in the other in the summer of 1942. The two firms converted from commercial production had always used many women in their regular line of manufacture and they placed women on factory work from the inception of wartime production, one in the fall of 1940, the other in the middle of 1941.

The analyses of occupations in small-arms and cannon manufacturing are replete with examples of the fallacy of considering war-industry occupations as traditionally men's or women's. In the transition period of hiring great numbers of women, men and women interchange on the same or comparable work on the same shift, or women do work on the day shift performed by men on the night shift. A certain type of work performed extensively by women in one plant may be done entirely by men in another plant. For instance, one arsenal had no women employed on even the simplest or lightest machine operations in making small-arms components, but had them driving electric trucks and car-loading machines, making large wooden packing boxes, operating band saws and nailing together the pack-

ing boxes. Other firms had no women on these operations but employed 60 percent women in certain machining departments.

In small-arms and cannon manufacturing women were operating a wider array of types and sizes of machine tools than in any other industry studied by the Women's Bureau.[3] This is significant because the standard machine-tool equipment that women have demonstrated they can operate has a wide application in other war industries. For this reason considerable detail is given in this report as to the specific machine makes and sizes as an indication of what women are doing and can do on machine tools.

Two plants were practically at peak employment and new persons hired were chiefly replacements. The other firms were in the process of expansion, having attained anywhere from 65 to 90 percent of their peak employment. At best, however, estimates of peak employment were mere approximations contingent on many indefinite factors. In all instances the plans were to use many more women in both factory and office work, there being opportunities for materially increasing the number of women in the office just as in the plant, as 40 to 82 percent of the office workers in the small-arms plants were men. The ultimate number of women that may be employed is dependent largely on the stringency of the male labor supply in each area, the extent to which draft boards may grant occupational deferments to the men, and the success of women on different types of work.

Due to the comparative lightness of the work it is possible to use many more women in small-arms manufacturing than in cannon manufacturing. It is estimated that up to 75 percent of the total employees may be women in small-arms manufacturing and up to 40 percent may be women in cannon manufacturing.

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[3] Studies have included machine-tool manufacturing, airframe assembly, small-arms ammunition and artillery ammunition manufacturing, and aircraft, optical and fire-control, and surgical and dental instrument manufacturing.

SMALL-ARMS MANUFACTURING AND THE EMPLOYMENT OF WOMEN

The small-arms firms visited make Garand rifles, Springfield rifles, Thompson submachine guns, .30-caliber and .50-caliber Browning machine guns (water cooled and air cooled), revolvers, automatic pistols, and shotguns. They assemble the arms and make most of the component parts, though there is some subcontracting which will be expanded as production quotas increase through new contracts. So much of the work involves use of standard machine-tool equipment that it is a logical field in which to develop subcontracting among the many machine shops.

Four of the plants manufactured solely small arms, a fifth manufactured mainly small arms but also some small cannon, and a sixth did much research and experimental work on gun mounts, gun carriages, mobile artillery, and tanks but manufactured some .30-caliber Browning machine guns. The percentage of women among the total employees in the six plants was respectively 3, 11, 23, 30, 19, and 11. The one with the largest proportion of women is a private establishment with many years of experience in employing great numbers of women in its regular line of commercial production, and in conversion to wartime production it carried over the policy of using women wherever possible. Those with the lowest percentages of women have been able to get liberal draft deferments for the men and a sufficient number of new male workers as the need arises; in the spring of 1942 male labor shortages began to develop and draft boards were not granting so many occupational deferments, which gave rise to an expansion in women's employment.

Detailed employment reports from four small-arms plants covering 39,619 workers reveal that 70 percent of the employees were on factory production, including machine operators, assemblers, and inspectors; 22 percent were factory nonproductive workers, including tool-crib and stock-room attendants, tool-room workers, service and maintenance workers, laboratory technicians, tool and gage designers, production engineers, factory clerical workers, and so forth; and 8 percent were office workers in administrative, personnel, accounting, engineering, and purchasing and procurement departments. The proportion of women in each of these three main categories varied greatly in the four plants covered. Women averaged 20 percent of the factory productive workers, their percentage in the four plants being respectively but a fraction of 1, 19, 24, and 40. Women averaged 8 percent of the factory nonproductive workers, with respectively less than 1, 11, 10, and 4 percent; and they averaged 35 percent of the office workers, with respectively 18, 43, 60, and 19 percent. Seventy-five percent of all women employed were factory productive workers, 9 percent were factory nonproductive workers, and 16 percent were office workers. The varying departmental segregations of employees in different plants necessitates a consolidation of major groups as shown in the accompanying table.

Departmental distribution of employees in four small-arms manufacturing plants

Department	All workers		Men	Women		
	Number	Percent of total	Number	Number	Percent of total workers	Percent of total women
Grand total	39,619	100.0	32,226	7,393	18.7	100.0
Total factory—Productive	27,653	69.8	22,089	5,564	20.1	75.3
General machining departments (machines of all types)	12,796	32.3	9,884	2,912	22.8	39.4
Barrel manufacturing	2,047	5.2	1,789	258	12.6	3.5
Turret lathes, engine lathes, automatic screw machines	1,286	3.2	1,212	74	5.8	1.0
Heavy grinders, hacksaws, punch presses, welding, forge	1,074	2.7	980	94	8.8	1.3
Woodworking machines	441	1.1	343	98	22.2	1.3
Heat treat, parkerize, sandblast, barrel tumble, plate	1,160	2.9	1,140	20	1.7	.3
Polishing and filing	1,941	4.9	1,632	309	15.9	4.2
Subassembly and final assembly	1,203	3.0	1,102	101	8.4	1.4
Assembly, packing, and repair	339	.9	248	91	26.8	1.2
Packing	259	.7	182	77	29.7	1.0
Inspection and proof firing	4,864	12.3	3,337	1,527	31.4	20.7
Trainees and apprentices	243	.6	240	3	1.2	(1)
Total factory—Nonproductive	8,616	21.7	7,945	671	7.8	9.1
Tool room (toolmaking)	2,642	6.7	2,358	284	10.7	3.8
Tool cribs	215	.5	199	16	7.4	.2
Stock rooms	816	2.1	716	100	12.3	1.4
Shipping and receiving	212	.5	192	20	9.4	.3
Service and maintenance	3,219	8.1	3,169	50	1.6	.7
Gage control and gage inspection: tool and gage design	292	.7	248	44	15.1	.6
Laboratory	106	.3	87	19	17.9	.3
Production control	227	.6	190	37	16.3	.5
Production engineering, safety, efficiency, methods	157	.4	133	24	15.3	.3
Factory clerical not elsewhere itemized	730	1.8	653	77	10.5	1.0
Total office	3,350	8.5	2,192	1,158	34.6	15.7
Personnel, time study, cost, pay roll	558	1.4	365	193	34.6	2.6
Accounting, finance, tabulating, mail and record	266	.7	120	146	54.9	2.0
Procurement and purchasing	172	.4	21	151	87.8	2.0
Engineering	332	.8	302	30	9.0	.4
Medical	62	.2	11	51	82.3	.7
Administrative offices not elsewhere itemized	1,960	4.9	1,373	587	29.9	7.9

[1] Less than 0.05 percent.

MACHINE-OPERATION PROCEDURES

Characteristic of small-arms manufacturing is the predominance of machine-tool operations, machine operators on production work composing 44½ percent of the total plant and office workers, or 64 percent of the factory productive workers. On each of the multiplicity of parts going into any weapon there is a gradual process of "worrying the metal away" by a series of machining operations bringing parts down to very fine tolerances. Most of the small arms and guns used in modern warfare must have "interchangeable" parts, making it possible for those worn and damaged to be replaced with spare parts when weapons are in actual use in the field. Interchangeability is imperative also when parts going into one weapon are manufactured by different subcontractors.

The .30-caliber Browning machine gun (air cooled) has 189 parts, with 1,800 separate machining operations—for example, 57 operations on the barrel extension, 66 on the bolt, and 38 on the barrel, these parts being some of the major components. An example of the large

amount of metal that must be removed by gradual machining is that the raw stock and forgings for one type of machine gun weigh 101 pounds and the finished steel parts weigh 18 pounds. Among the major components are the gun-body forging, weighing 45 pounds in contrast to the finished gun body's 5½ pounds, the barrel forging weighing 10 pounds and the finished barrel 6 pounds, the slide-butt forging weighing 22 pounds and the finished slide butt 4 pounds.

Plant Lay-out.

The small-arms factories have been laid out on a straight line-production basis as much as possible, with some machines set up for one operation for the duration of the war, but others must be fitted with several tools to perform a series of operations. There are variations in plant lay-out, some having machines arranged by type with milling machines, drill presses, grinders, and so forth, in separate departments, all parts being routed to these departments for their respective milling, drilling, and grinding operations. Others have departmental segregations based largely on the parts manufactured, such as the barrel, barrel extension, trunnion block, bolt and receiver, with machine tools of all types necessary to make each part. There are also miscellaneous machining departments where parts of all sizes are made.

The usual practice is to have somewhat of an intermixture of the two methods, some departments composed of machines of one type and other departments composed of all machines necessary to make some major component as the barrel, trunnion block, or bolt, and other general machining departments making a whole array of parts.

Types of Machines.

The equipment varies somewhat from plant to plant because different types of machines can be adapted to perform the same operation, but most of them are standard machine tools. There is always a very marked predominance of milling machines due to their adaptability for doing a variety of work. Most of the small-arms factories have 40 to 50 percent milling machines, 10 to 20 percent drill presses, with profilers, grinders, barrel machines, lathes, and so forth following next in importance as shown below. A typical small-arms plant inventory shows the following distribution of principal machine-tool items:

Type of machine	*Number*	*Percent of total*
Total	2,608	100.0
Milling machines	960	36.8
Drill presses	302	11.6
Profilers	291	11.2
Barrel machines (drills, reamers, etc.)	226	8.7
Grinders	214	8.2
Lathes (turret lathes and engine lathes)	201	7.7
Automatic screw machines	126	4.8
Woodworking machines	122	4.7
Thread grinders and thread millers	46	1.8
Punch presses	37	1.4
Shapers	34	1.3
Shavers (slotters)	32	1.2
Broaches	7	.3
Planers	3	.1
Miscellaneous (drop hammers, shears, etc.)	7	.3

Machine Operators.

The distribution of machines by type does not give a wholly true occupational distribution of machine operators because of the common practice of having one person run more than one machine.

Either a series of operations is performed on one part using one machine at a time, or concomitant operations are performed keeping all machines going at once. In some plants a battery of six to eight machines is kept running by a single operator, the worker constantly moving from one machine to another loading and unloading parts. Where several machines are operated at one time, the speed is not so high and the machining cycle is longer, making multiple operation possible. Sometimes when the machining cycles are relatively long the operator runs fewer machines, perhaps only one, but files and burrs parts as well. Most operators make spot checks of parts, using micrometers, calipers, or fixed gages.

Examples of combinations of machines operated both by men and by women

Cincinnati power mill No. 0–8, hand mill, and drill press.
Brown & Sharpe mill No. .000, 3 machines operated by one person.
Fellows Gear Shaper, 3 machines operated by one person.
Cincinnati mill No. 1–12 and a drill press.
Automatic profiler and a drill press.
Natco drill (multiple spindle), Leland Gifford drill, and Cincinnati mill No. 0–8.
Hand mill, bench profiler, and two Cincinnati mills No. 0–8.
Pratt & Whitney profiler and 3 hand mills.
Two hand mills and one Milwaukee mill Model H.

In two plants where detailed occupational figures are available there is the following breakdown of machine operators, who are classified according to type of machine on which they spend most of their time.

Type of machine	*Number of operators*	*Percent*
Total	4,710	100.0
Milling machine	2,182	46.3
Barrel machine	441	9.4
Profiling machine	420	8.9
Woodworking machine	400	8.5
Grinder	334	7.1
Lathe	268	5.7
Drill press	223	4.7
Punch press	156	3.3
Automatic screw machine	99	2.1
Broaching machine	55	1.2
Shaper or shaving machine	52	1.1
Thread mill, honing, or die-sinking machine	52	1.1
Hacksaw or power shear	28	.6

Machine Setters.

The usual practice is to have machine setters who make all the machine set-ups so that the operators need only load and unload the machines and make spot checks of parts, using gages, micrometers, and calipers. Usually the plant lay-out, routing of work, and time allocation on each operation are premised on a system of set-up men for the majority of the machine operators, and the fact that women have been brought into the plants has not necessarily entailed the use of extra set-up men. As a means of making the maximum use of

skilled manpower it has proved advantageous to have men with machine-setting ability devote all their time to that, while unskilled workers are trained to carry on the more routine operation of machines.

In none of the plants visited were women employed as full-time machine setters, but it would be possible to train them for this work. Though machine setters generally are provided, some operators are required to make their own set-ups of short runs of certain parts. Men usually are employed on such work, but in some instances women set their own machines and more and more reliance is placed on their ability to do this, given the opportunity to learn.

Movemen and Material Handlers.

Material handlers or movemen are usually employed to move "tote boxes" an dtake materials and supeipls to and from the machine operators, thus enabling the operators to devote all their time to machine tending. The contention is sometimes made that extra movemen must be employed when women are hired, but this is hardly a legitimate reason for considering that women should not receive the same rate as men for the job. If the former male machine operators spent part of their time moving materials this was no economy, because such time would be paid at the machine operators' rate rather than that of a laborer. If extra movemen have been hired, the operators' efficiency and output may have increased sufficiently to more than offset the laborers' wages, and in the last analysis the all-over labor cost per unit of output is the major consideration.

MACHINE OPERATORS

As already pointed out, 44½ percent of the total employees were machine operators, about one-fifth of these being women. All but one of the small-arms firms had women on machine operations, the proportion in some machining departments running as high as 60 percent. Usually they were employed in general machining departments where smaller parts were made, but an increasing number were being placed on major components as well, such as the bolt, receiver, trunnion block, and so forth. The extent to which women can work on large parts is shown by the proportion of women employed in some of the machining departments of the plant most advanced in its use of women:

Department	*Total number of operators*	*Percent women in total*
General machining	1,388	57.3
Barrel extension	287	32.1
Trunnion block	564	48.2
Bolt	390	34.9
Side plates and cover	226	48.7

Management's constant search for improved production techniques to lighten the machine operations made it possible for women to do a considerable share of the work on larger parts. New fixtures were designed to replace heavy arbors; benches or machines were raised or lowered to improve work lay-out and reduce lifting; conveyors were installed to slide parts from one machine to another; operations were broken down, separating the very heavy work from

the medium-heavy and light work; and the skill required in operating certain machines was reduced by installing automatic stops and adjusting machines for depth of cut.

The following analysis of specific machine operations performed by women is by type of machine rather than on a departmental basis because the machine is more significant than the department.

Milling-Machine Operators.

More women were operating milling machines than any other one type of machine; in one plant 35 percent of the women were milling-machine operators. Hand mills and small and medium-size power mills were the most numerous types of milling machines. Women generally operated hand mills, Brown & Sharpe mills Nos. .000, 12, and 2, Cincinnati mills Nos. 0–8, 1–12, and 1–18, Van Norman mill No. 118, and spline mills. The plant employing the largest proportion of women in factory work had no men on hand mills, small milling machines, and medium-size mills except for a very few operations on large parts too heavy for women to handle.

Typical milling machines operated by women (greatest numbers on those starred)

*Hand mills (Kent Owens, Nichols, Whitney, Vernon, Van Norman, Noble & Westbrook, and U. S. hand mills).
*Cincinnati power mill No. 0–8.
*Cincinnati power mill No. 1–12.
*Cincinnati power mill No. 1–18.
Cincinnati power mill No. 2–18.
Cincinnati power mill No. 2–24.
Cincinnati power mill No. 2 (vertical).
Cincinnati power mill Hydromatic No. 3–24.
*Brown & Sharpe power mill No. .000.
*Brown & Sharpe power mill No. 12.
*Brown & Sharpe power mill No. 2 (plain light type).
*Brown & Sharpe power mill No. 2 (vertical light type).
*Van Norman power mill No. 118.
Milwaukee (Kearney & Trecker) power mill, Model H.
Milwaukee (Kearney & Trecker) power mill, Simplex 12–24 and 18–24.
Sundstrand Rigidmil.
*Pratt & Whitney power mill.
*Taylor & Fenn spline mill.
*Pratt & Whitney spline mill.
U. S. Multi-miller.

Milling machines most frequently operated by men and not women were large Cincinnati Hydromatics (plain and duplex), large Cincinnati vertical millers, Milwaukee duplex millers (large), and large vertical boring mills. Very often the arbors and fixtures on these machines are heavy, the controls are harder to manipulate, and the parts machined are heavy in themselves.

In some of the Canadian small-arms firms visited in the earlier survey over 60 percent of the milling-machine operators were women and this proportion was to be increased. Thirty percent of the milling-machine operators were women in one of the firms covered in the United States survey. All plants had plans for hiring many more women for milling-machine operation.

Drill-Press Operators.

Women have long been employed as drill-press operators in various industries, so finding them in great numbers in the small-arms plants was no surprise. In one plant almost 80 percent of the drill-press operators were women. They did drilling, reaming, burring, tapping, and countersinking, and much of the work was jig drilling which is easily learned.

Typical drill presses operated by women (greatest numbers on those starred)

*Avey drills Nos. ½, 1, and 2 (single and multiple spindle).
*Allen drills (single and multiple spindle).
*Delta drills (single and multiple spindle).
*Buffalo bench drills.
*Sigourney bench drills.
*Leland Gifford drills Nos. 1, 2, and 3 (single and multiple spindle).
Krueger drills.
Kingsbury automatic drills.
Natco multiple-spindle drills and tappers.
U. S. drills.
Fosdick drills.
Bakewell precision tappers.

Though most of the women were on small and medium-size drills, a few operated the larger and more automatic types such as Kingsbury drills, which are automatic in operation, the worker standing in one place loading and unloading the machine as a series of drilling operations is performed on a number of parts revolving in the machine at one time. The larger drills such as the Fosdick, Natco, Krueger, and United States drills generally were operated by men, and in some plants only men were employed because the parts handled were so large. However, two plants in particular were beginning to put women on larger drills. No women operated such heavy-duty machines as American Tool Works radial drills, Cincinnati Bickford radial drills, and Ex-Cello horizontal boring machines.

The only limitation on using women for drill-press work is the combined weight of the jig and the part being drilled. However, if the jig merely has to be slid back and forth on the bed of the drill without being lifted or turned over, the weight can be quite great before exceeding the strain limit expected of an average woman. To reduce the effort required to push and pull a large jig it is possible to mount a small button under each bottom corner of the jig to reduce the sliding surface, thus eliminating the suction created by sliding a flat metal surface over the bed of the drill.

Profiling-Machine Operators.

A profiling machine is a special milling machine with a master form or template that has the desired irregular shape to be machined on another piece of metal. A guide pin follows the master form while the milling cutter reproduces the part. Profilers are used extensively in small-arms manufacturing because of their adaptability in making the many irregular shapes required on gun components. Ten percent of the machine operators were profiling-machine operators. Three of the five plants employing women on machines had

a few on actual profiling and a fourth firm had women on profilers but doing milling rather than profiling.

In hand profiling on the master-follower type of machine the operator must have a sense of touch in holding the guide pin against the template and exert some force in manipulating the two controls at the same time. Because the work was considered more strenuous and more skilled than some of the rest, women were not until recently placed on profiling, but they have demonstrated a good sense of touch and skill and are to be employed much more extensively. Pratt & Whitney profilers No. 12–B were the most common kind operated by women, but others were National Broach automatic profilers, Thompson profilers, Newton profilers, and Wade bench profilers.

Grinding-Machine Operators.

In all cannon and small-arms manufacturing there is much grinding to attain the close tolerances and the high finishes required. Two of the firms employed women on all types of grinding, two had none on grinding, and a fifth had women only on wet centerless grinding because of a State law prohibiting their employment on dry grinding. Abrasive-wheel jobs are hazardous unless protective measures are taken, but in the plants visited precautions to protect the health of the workers usually were adequate. Local exhausts were installed over the machines to draw off dust particles, wheels were covered with hoods as a protection against flying particles, and goggles and respirators were supplied to workers.

Women most frequently operated small tool and cutter grinders, small and medium-size surface grinders, and plain grinders such as Norton surface grinders 6″ x 18″ and 6″ x 30″, Brown & Sharpe surface grinders No. 2, Brown & Sharpe plain grinders Nos. 5 and 12, Norton cylindrical grinders 6″ x 18″, Landis grinders, and Henry Prentice abrasive surface grinders No. 3–B. A few operated Cincinnati centerless grinders No. 2 and Blanchard grinders.

As a rule men were employed on the heavy-duty Blanchard grinders, Hanchett surface grinders, and Mattison grinders, which generally were used for preliminary machining operations on forgings and bar stock. Much of this work is heavy, but it is possible to segregate the light work and that had been done in some places. Women operated one of the more automatic types of Blanchard grinders, feeding small parts onto a revolving dial.

Frequently hundreds of small parts were ground down at one time on these heavy-duty grinders, and so much time was consumed in laying out parts, loading and unloading the machines, and burring and gaging parts that the operators spent relatively little of their time on actual machine tending. Hence, some plants planned to have women lay out the work, assist with the loading and unloading of the machines and the burring and gaging of parts, thus releasing the operators to devote their time to actual machine operating on several machines instead of one.

Turret-Lathe, Engine-Lathe, and Automatic-Screw-Machine Operators.

Women constituted 6 percent of the workers in the lathe and screw-machine departments but not all were machine operators; some were

burring, filing, and gaging parts. Two plants employed women on automatic screw machines, including Brown & Sharpe automatic screw machines Nos. 00G, 0G, 00, 0, and 2–G and Brown & Sharpe Wire-Feed screw machine No. 2. They watched the functioning of the machines, gaged parts, and did some filing and burring. Men set up the machines and kept them loaded with bar stock. The other companies had plans for employing women on smaller automatics, one planning to have all such machines operated by women. No women operated the very large automatic screw machines such as the Gridley automatics, Cleveland automatic turret machines, Cincinnati Acme automatic screw machines, and National Acme automatic screw machines. The main task on these machines is the complicated and skilled set-up work, which sometimes takes four or five days, but once set up they operate automatically, needing only occasional attention.

Three plants employed women extensively on turret lathes, engine lathes, and bench lathes; two had no women on such work. Those selected for work on large turret lathes were tall, so that they could more readily reach the multiplicity of controls.

Types of lathes operated by women

Warner & Swasey turret lathes Nos. 2, 3, and 4.
Bardons & Oliver turret lathes.
Gisholt turret lathe Nos. 4 and 1–L (large).
South Bend bench lathe.
Rivett bench lathe.
Pratt & Whitney bench lathe.
Hardinge bench lathe.

Only a few women operated the large-size turret lathes, the work on these being without question more strenuous than on most other types of machines. The parts are heavier, the hand tools required are heavier, and the expanse of the machine itself makes it more strenuous to operate. Bullard vertical turret lathes, Warner & Swasey turret lathes Nos. 2–A, 4–A, and 3–A, Potter & Johnston turret lathes No. 6–A, Jones & Lamson lathes Nos. 7A5, 8B, 8C, 8A, and the largest Bardons & Oliver turret lathes and largest Gisholt turret lathes were all operated by men. These are used in machining the very heaviest parts and for rough machining forgings.

Barrel-Machine Operators.

Barrels are generally manufactured in separate departments with machines set up on a production-line basis. Variations were found in the extent to which women were engaged on barrel-machining operations, two firms employing no women, a third employing them on a very few operations, and a fourth having 21 percent women in its barrel departments. The last named had no women working on .50-caliber barrels but had them on practically every operation on .30-caliber barrels.

The general machining operations on any barrel are about the same, and to assist in the visualization of the types of work involved and the extent to which women were employed, a sequence of principal operations on a .30-caliber barrel is given on pages 13–14.

Operation	*Sex of operator*
Squaring and countersinking both ends to working length, Davis & Thompson cut-off and centering machine.	M.
Rough milling butt end, Brown & Sharpe mill No. 12	M. and F.
Milling muzzle end to working length, Brown & Sharpe mill No. 12	Do.
Turning muzzle end for drilling-machine chucks, LeBlond engine lathe.	Do.
Spot grinding for steady rest, Norton cylindrical grinder 6″ x 30″	Do.
Rough turning and chamfering breech end, Jones & Lamson Fay automatic lathe 12″ x 63″.	Do.
Drilling bore from breech end, Pratt & Whitney 2-spindle horizontal barrel drill (operator runs 4 machines).	Do.
Rough reaming bore, Baush 12-spindle vertical barrel-reaming machine.	M.
Recentering ends concentric with bore, Wm. Steel recentering machine.	M. and F.
Spot grinding for steady rest, Norton cylindrical grinder 10″ x 36″	Do.
Grinding rest spot, Norton cylindrical grinder 6″ x 30″	Do.
Rough turning taper section at muzzle end and turning and forming breech end, Jones & Lamson Fay automatic lathe 8″ x 33″.	Do.
Spot grinding taper on muzzle end, concentric with bore, Norton cylindrical grinder 10″ x 36″.	Do.
Turning upper section of taper and radius finish, Jones & Lamson Fay automatic lathe 8″ x 33″.	Do.
Turning and forming muzzle end and forming band bearing groove, Jones & Lamson Fay automatic lathe 8″ x 33″.	Do.
Recentering both ends concentric with bore, drill press, 2-spindle	Do.
Semifinish grinding of breech end, Norton cylindrical grinder 10″ x 36″.	Do.
Threading breech end, Lees-Bradner thread mill or Hanson & Whitney hobbing machine.	Do.
Form milling top, Brown & Sharpe mill No. 12	Do.
Milling rear hand guard grooves, Cincinnati mill No. 0–8	Do.
Finish grinding lower band bearing, Norton cylindrical grinder 6″ x 30″.	Do.
Finish grinding taper at rear of gas cylinder bearing, Norton cylindrical grinder 10″ x 36″.	Do.
Finish grinding gas cylinder bearing and gas cylinder lock diameters, Norton cylindrical grinder 10″ x 36″.	Do.
Reaming base, Wm. Steel 12-spindle vertical reaming machine	Do.
Broaching lower band retaining pin slot, Colonial vertical hydraulic broach (small).	Do.
Milling 3 splines for gas cylinder, Brown & Sharpe mill No. 12	Do.
Countersinking breech end to remove hardened stock, Fosdick drill	Do.
Finish reaming bore, Pratt & Whitney 2-spindle horizontal reamer, each operator running 3 spindles (1½ machines); or on a Pratt & Whitney 6-spindle reamer.	Do.
Rifling, Pratt & Whitney 2-spindle rifling machine (operators run 3 or 4 machines).	Do.
Chambering (rough and finish), Pratt & Whitney 12-spindle chambering machine. Chambering is machining the seat for the cartridge.	Do.
Forming radius at intersection of ramp and chamber, Austin Hastings 2-spindle Fosdick drill.	Do.
Forming radius at mouth of ramp, Austin Hastings 2-spindle Fosdick drill.	Do.
Milling bullet nose clearance, Brown & Sharpe No. .000 mill or Nichols hand mill.	Do.
Countersinking and facing muzzle end to finish length and chamfering, Pratt & Whitney 8-spindle chambering machine or Krueger 5-spindle chambering machine.	Do.
Chasing muzzle and thread, thread milling machine	Do.
Honing chambers, Carlin honing machine	Do.
Marking manufacturer's initials and date of manufacture, Schmidt hydraulic marking machine.	Do.

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Operation	Sex of operator
Proof firing of barrels	M.
Drilling vent hole in gas cylinder bearing	M. and F.
Burring and reaming vent hole (bench work)	Do.
Polishing ramp and rinsing, bench polishing machine	Do.

In this sequence of operations on .30-caliber barrels there were over 30 inspections, including visual, gage, and magnaflux inspection, Brinell hardness testing, and inspection of line straightening. Women participated in most of this, including magnaflux inspection, but were not on final inspection, line-straightening inspection, nor Brinell hardness testing.

Interspersed were numerous barrel-straightening operations of two types: Straightening of the outside surface and straightening of the bore. Outside straightening was done by both men and women, using presses on which are mounted dial indicators showing the accuracy of the barrel. The line straightening or shadow method of straightening, which was all done by men, involved sighting through a barrel onto a horizontal black line on a ground-glass window about 20 feet away. This line is reflected as two parallel lines in the barrel and any curvature indicates the necessity for straightening, skill being required to know where and how much pressure to apply with a straightening jack to properly align the barrel.

In this sequence of operations there were also various descaling, sandblasting, parkerizing, heat treating, oiling, and cleaning operations, all done by men.

Women performed a few operations on .50-caliber barrels for air-cooled Browning machine guns, these being considerably larger than the .30-caliber. They operated Pratt & Whitney barrel reamers, Builders' Iron Foundry reamers, Pratt & Whitney barrel drills, and Pratt & Whitney chambering machines. Women were to be placed on additional operations on the .50-caliber barrels for air-cooled machine guns, but it was not deemed feasible to employ them on much work on .50-caliber barrels for water-cooled Browning machine guns because these are so much larger and heavier.

Punch-Press Operators.

In small-arms manufacturing there is not much punch-press work, punch-press operators composing only 3 or 4 percent of the total machine workers. Some of the work such as blanking and forming side plates is very heavy and only men were employed on this. Women blanked, formed, pierced, notched, and trimmed such machine-gun parts as the cam extractor, sear stop, bar pin lock, slide guide piece, and small washers. Small rifle parts, such as the latch clips, triggers, ferrules, butt plates, and swivel butts, were blanked and formed by women. Some of the presses were foot controlled and others were hand controlled with safety guards.

Types of punch presses operated by women

Bliss punch press Nos. 6, 20, 2, 21½, 19C, 21S, and 26.
Niagara punch press No. 1½.
Consolidated punch press No. 6.
Toledo punch press No. 2.

Miscellaneous Machine Operators.

In small-arms manufacturing there is often required a type of metal shaving or slotting operation which is done on Pratt & Whitney shavers, Logan shavers, and Taylor & Fenn shavers. Women could do practically all this work and already they were doing a fair share. A few women were operating Hanson & Whitney thread millers, ExCello thread grinders, Fellows Gear Shapers, and Lapointe broaches. The broaches that they operated were small, all the large ones such as the Cincinnati duplex vertical broaches, large Colonial broaches, Lapointe broaches, and Footburt broaches being operated by men. The large ones require the operator to stand on a raised platform, and much of the work of loading and unloading parts is heavy.

In none of the plants did women operate cut-off saws or abrasive cut-off wheels, which are used for cutting bar stock to size. Most of this work is purely manual labor of moving bar stock and loading it into the machines, which are largely self-operating when once set up. Only a few persons were employed on this and they did both the light and the heavy work. If the volume of light work were sufficient to keep one or two people busy, women could do this.

Woodworking-Machine Operators.

Rifles have a number of wooden components, including the main gun stock, front hand guard, and rear hand guard, which are made of walnut. The manufacture of these parts requires high-speed woodworking machinery. Two of the firms visited had wood gunstock departments. In one, women composed 28 percent of the work force, in the other no women were employed. The one employing women had not intended originally to employ them for this work, but with the great increase in volume of production, the introduction of a conveyor system, and the specialization in machine operations it was deemed feasible.

Men and women were often seen doing work that was the same or very similar.

Some of the major types of woodworking machines operated by both sexes

Onsrud wood-turning lathe. (These machines shape the gun stock by following a master cam; each operator tends three machines.)
Onsrud router (single spindle). (Many women on these machines.)
Onsrud router (multiple spindle). (Only a few women on these.)
Wood shaper (double spindle).
Wood profiler.
Pantograph machine.
Milling machine (horizontal).
Band saw.
Drill press (Onsrud drills and Fosdick drills).
Rotary sanding machine. (The sanding and finishing of wooden pieces formerly was done by hand, but now is done on sanding machines.)

BURRING, FILING, AND POLISHING

Machine operators quite frequently burred and filed parts that they had machined, but in addition there were many full-time filers, burrers, precision filers, and polishers. Employees on this type of work composed about 5 percent of the total (see table, p. 5). With the

exception of machine operating and inspection, more women did this type of work than any other. About 16 percent of the burrers, filers, and polishers in the four plants with detailed information were women and in one instance the proportion ran as high as 30 percent.

Women generally filed and burred the smaller parts, using files, scrapers, portable burring machines, high-speed lathes, belt sanders, disk grinders, and emery cloth. Sometimes they straightened parts, using hand mallets and bench vises. In all the plants there still were great numbers of men doing small-parts filing, burring, and straightening similar to that done by women. One reason so many men had been retained is that filing of gun parts has been considered precision work requiring considerable skill, but women have now demonstrated their ability to pick up the techniques involved. Men did most of the precision filing, bringing parts to very precise tolerances, and the filing of larger parts such as the bolt, trunnion block, side plates, and receiver. But more and more women were being placed on precision filing and work on heavier parts such as the bolt.

One plant could not employ women on polishing because of a State law restricting this as an occupation for women. Elsewhere women were engaged on a certain amount of polishing, using rag wheels, emery wheels, and wire brushes; some were reaming and lapping parts on small bench lathes and lapping machines. The work of women on polishing was not a war innovation in these plants, a few having done this during peacetime, but the proportion had been greatly increased.

ASSEMBLY

Subassemblers and assemblers were not a major occupational group as in some industries, and they composed only 2 percent to 5 percent of the total workers in the small-arms plants. Women constituted 8 percent of the assemblers and the plant employing them on the widest array of assembly work had 17 percent. Most of the small-arms subassembly could be done by women and much of the final assembly, depending on the weight of the weapon.

.30-Caliber Rifles.

Most parts for .30-caliber rifles are light and women were doing both subassembly and final assembly, many operations being identical with those done by men. Women were doing about one-fourth of the assembly work and ultimately would do perhaps 60 percent.

Some of the principal assemblies performed by women and by some men

Trigger assembly (trigger, sear, and sear pin).
Trigger-guard assembly (trigger guard and stop hammer).
Trigger housing assembly (clip ejector, hammer, trigger mechanism, safety and trigger guard).
Rear hand-guard assembly (rear hand guard and rear hand-guard band).
Front hand-guard assembly (front hand guard, front hand-guard ferrule, front hand-guard spacer).
Butt-plate assembly.
Bolt assembly (bolt, extractor, extractor spring, extractor-spring plunger, firing pin, cartridge-ejector spring).
Gas-cylinder assembly (gas cylinder, gas-cylinder plug, gas-cylinder-plug screw, swivel stacking, and swivel-stacking screw).
Barrel and receiver assembly (barrel and receiver assembled with rear sight, feeding mechanism, and hand guards).

Head bolt spacing (a hand-reaming operation on the bolt to get the proper clearance after the barrel and receiver are assembled).

Men assembled the major components such as the stock assembly, barrel, and receiver into the completed rifle.

Revolvers and Automatic Pistols.

Women had normally not been used in the assembly of revolvers and automatic pistols. Not until the summer of 1942 were a few women placed on subassembly of automatic pistols, and they still did none of the assembly on revolvers. Only the most skilled gunsmiths were used to assemble revolvers because extreme precision and care are required, each revolver being assembled in its entirety by one man. A revolver is more or less custom made, with parts filed, polished, and lapped down to fit each other properly. Most of the men were old-time gunsmiths far beyond the draft age, so there was no danger of their being drawn off into the Army, and hence no need of thinking of replacing them with women. The making of automatic pistols is not quite so skilled and some women were filing, polishing, and fitting parts in subassembly.

.50-Caliber Browning Machine Guns.

In one plant women were doing most of the subassembly on .50-caliber Browning machine guns but nowhere were they on final assembly operations. Typical assemblies performed by women were the extractor, spring rod, retracting slide, bolt, rear sight, buffer body, buffer-body tube, back plate, and cover assembly. Most of this involved use of simple bench tools such as screw drivers, pliers, arbor presses, files, and so forth. They did some of the lighter riveting on the cover assembly, but the riveting on case assemblies was done by men, this being much heavier work.

Much of the final assembly on .50-caliber machine guns is quite heavy but some of the work could be broken down so that women could do the lighter tasks. The men employed for this had a knowledge of the proper functioning of the machine guns and were versatile enough to do practically any of the work.

.30-Caliber Browning Machine Guns.

Plants making .30-caliber machine guns had not gone so far in the employment of women on assembly work as those making the .50-caliber, though women could do a larger proportion of the work on those of smaller caliber because of their lighter weight. Some of the subassemblies performed by women on .30-caliber machine guns were the front-sight assembly, rear-sight assembly, trigger-frame assembly, trigger-mechanism assembly, and accelerator assembly. Women had just been started on this work and many more were to be employed.

INSPECTION

Inspectors are one of the major occupational groups in any small-arms manufacturing plant and with the exception of machine operators they compose the largest single group of workers. Twelve percent of the total employees were inspectors, 31 percent of the inspectors being women, with the proportion of women running as high as

exception of machine operating and inspection, more women did this type of work than any other. About 16 percent of the burrers, filers, and polishers in the four plants with detailed information were women and in one instance the proportion ran as high as 30 percent.

Women generally filed and burred the smaller parts, using files, scrapers, portable burring machines, high-speed lathes, belt sanders, disk grinders, and emery cloth. Sometimes they straightened parts, using hand mallets and bench vises. In all the plants there still were great numbers of men doing small-parts filing, burring, and straightening similar to that done by women. One reason so many men had been retained is that filing of gun parts has been considered precision work requiring considerable skill, but women have now demonstrated their ability to pick up the techniques involved. Men did most of the precision filing, bringing parts to very precise tolerances, and the filing of larger parts such as the bolt, trunnion block, side plates, and receiver. But more and more women were being placed on precision filing and work on heavier parts such as the bolt.

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ASSEMBLY

Subassemblers and assemblers were not a major occupational group as in some industries, and they composed only 2 percent to 5 percent of the total workers in the small-arms plants. Women constituted 8 percent of the assemblers and the plant employing them on the widest array of assembly work had 17 percent. Most of the small-arms subassembly could be done by women and much of the final assembly, depending on the weight of the weapon.

.30-Caliber Rifles.

Most parts for .30-caliber rifles are light and women were doing both subassembly and final assembly, many operations being identical with those done by men. Women were doing about one-fourth of the assembly work and ultimately would do perhaps 60 percent.

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Trigger assembly (trigger, sear, and sear pin).
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INSPECTION

Inspectors are one of the major occupational groups in any small-arms manufacturing plant and with the exception of machine operators they compose the largest single group of workers. Twelve percent of the total employees were inspectors, 31 percent of the inspectors being women, with the proportion of women running as high as

62 percent in one plant. One-fifth of the women in the 4 plants reported were inspectors (see table, p. 5).

Some of the workers did only visual inspection but generally they combined this with the use of precision measuring instruments, these including dial indicators, thread gages, plug gages, ring gages, vernier height gages, vernier depth gages, scales, micrometers, and calipers. Some, but not all, were required to check parts against blueprints.

The women inspected primarily small parts, some in process of manufacture and some in final inspection. They did crib inspection, receiving inspection, heat-treat inspection, and inspection out on the floor among the machine operators. They sometimes combined inspection with burring, filing, and lapping of parts to fit fixed gages. In the heat-treat departments they were doing Rockwell hardness testing and Brinell hardness testing. In the .30-caliber-barrel department of one plant women did most of the inspection work, including visual, gage, and magnaflux inspection.

All proof firing was done by men, requiring a constant handling of the weapons and mounting and clamping the larger ones into stands prior to firing. Women should be able to do the proof firing of rifles, revolvers, automatic pistols, and small submachine guns because the weight is not excessive. They could assist with the proof firing of .30- and .50-caliber machine guns if men did the heavy lifting. At the Aberdeen Proving Grounds in Maryland women are assisting with the proof firing of everything from Garand rifles and tommy guns to huge railroad guns.

HEAT TREAT, PARKERIZE, BARREL TUMBLE, PLATE, SANDBLAST, WELD, FORGE

Men did all the heat treating, barrel tumbling, plating, sandblasting, electric cleaning, spray painting, and the great bulk of parkerizing. The numbers on these jobs were small, the men interchanged on different types of work, they had a general knowledge of different properties of metals, a knowledge of methods of hardening and treating metals, and they performed heavy as well as light tasks.

Women commonly did Rockwell hardness testing in heat-treating departments. In one plant a few were being taught parkerizing of cartridge clips, the operation of heat-treat furnaces, and the operation of degreasing machines, with men doing any heavy lifting. A few women had been employed for many years on a process known as "blueing," which is similar to parkerizing, giving a protective coating to revolver and pistol parts. The temperature and atmospheric conditions cause the parts to turn different shades and women matched up the shades so that all parts assembled into one firearm would be the same shade. Women could parkerize the smaller parts of firearms, clean parts, and do spray painting.

The forge and welding shops were not large and no women were used on any of the work, most of which was quite heavy. The welders were able to do almost any kind of welding, brazing, soldering, and sheet-metal work. Much of the welding was on jackets for water-cooled machine guns, which were heavy.

PACKING

After assembly and proof firing the firearms are disassembled, all parts thoroughly cleaned, reassembled, and then given final inspection. Most of the disassembly, reassembly, final inspection, and gun greasing was done by men. A few women reassembled bolts and buffer bodies for machine guns after the parts had been cleaned.

About 30 percent of the packers were women and most of them were counters, sorters, wrappers, and packers of spare parts. Parts greased or oiled were wrapped in heavy oil paper before packing into envelopes, cartons, or boxes. A few women were nailing metal strips around large packing boxes, this being one of the more unusual things they did. The only limitation on what women can do in packing departments is the weight of the work.

FACTORY NONPRODUCTIVE JOBS

In every manufacturing establishment there are large numbers of workers not directly engaged on production operations but essential in maintaining the flow of production. The table, page 5, shows that over one-fifth of the total factory and office employees were nonproductive factory workers, including tool-room workers, tool-crib and stock-room attendants, shipping and receiving clerks, service and maintenance men, production-control clerks, production engineers, gage inspectors, laboratory technicians, and general factory clerical workers. Only 8 percent of this group were women and this proportion could be materially increased.

Tool Room (Tool Making).

When the present war program started in this country women were rarely found in tool-room work, tool making being considered the province of highly skilled tool and die makers, jig and fixture makers, and first-class machinists. The mention of employing women in tool-room work was considered an absurdity by managers and foremen in plants visited by Women's Bureau representatives early in 1941. But since the spring of 1941 a gradual transformation has taken place and women are making great inroads in tool-room work.

In one small-arms plant the largest single occupational group of women, aside from inspectors, were those in the tool room, where 40 percent were women. The proportion for all plants was 11 percent women. As a rule men set up the machines for the women, but some women were setting up their own and more were learning on the job to do this. The women were most frequently making cutters, reamers, end mills, gages, and draw bars. In addition to machine operating they did filing, burring, hand lapping, hand honing, polishing, and stamp marking of parts. In many cases the work done by women was the same as that done by men.

Most of the women operated bench-size lathes, small and medium-size milling machines, tool and cutter grinders, and surface grinders.

Some specific machines operated by women

Hardinge bench lathe.
Rivet lathe.

Hendy engine lathe 12'' x 30'' and 12'' x 42''.
Monarch engine lathe 18'' and 10'' x 20''.
Bardons & Oliver turret lathe Nos. 2 and 3.
Southworth turret lathe.
Brown & Sharpe plain grinder Nos. 10, 12, and 5.
Brown & Sharpe surface grinder Nos. 2 and 5.
Brown & Sharpe tool and cutter grinder Nos. 10 and 13.
Landis grinder.
Carboloy tool and cutter grinder.
Hardinge hand miller.
Brown & Sharpe universal milling machine Nos. 2A and 3A.
Brown & Sharpe plain milling machine Nos. 2 and 2B.
Van Norman milling machine No. 22–L.
Milwaukee milling machine Model H.
Cincinnati milling machine Nos. 2 and 1–12.
Avey drill press.
Cincinnati shaper 20''.
Hendy shaper 12''.

Tool Cribs and Stock Rooms.

More women were employed as stock-room attendants than as tool-crib attendants. All plants still had many men on these types of work who could be replaced by women, and usually there were plans to augment the numbers of women. Twelve percent of the stock-room workers were women acting as stock-record clerks and storekeepers, filling cribs and boxes with parts and supplies and putting up orders to be routed into the plant. Seven percent of the tool-crib attendants were women who handled the smaller tools, jigs, and fixtures, checking them in and out and keeping records. This work requires a knowledge of different types of tools, jigs, and fixtures which women were acquiring gradually on the job.

Gage Control and Gage Inspection.

A development facilitated by the war was the service of women on gage inspection in two plants covered. This work requires great care and skill, a certain knowledge of mathematics, and use of a wide range of measuring instruments. In the gage-control and inspection departments all the various gages and dies used in production are checked for accuracy, the degree of accuracy of the parts manufactured being dependent on the correctness of the gages and dies.

Women were checking mainly thread gages, plug gages, ring gages, and fixed gages of smaller size but they would later be taught the inspection of small and medium-size fixtures and dies. Typical measuring devices and instruments used by women in this work were optical comparators, shadowgraphs, Carl Zeiss toolmakers' microscopes, Pratt & Whitney supermicrometers, vernier height gages and depth gages, calipers, micrometers, Rockwell hardness-testing machines, and Johansson gage blocks.

Laboratory.

So many men had been drafted in the laboratory of one arsenal that women were being hired as laboratory aides; at the time of the visit 30 percent of the laboratory workers were women and this proportion was to be increased. This was not an experimental laboratory but was for industrial control purposes, making tests of steel, oil, paint, and other materials purchased for use in manufacture.

Types of laboratory work done by women

Magnaflux inspection.
Jominy hardenability tests.
Calibration of thermocouples.
Repair and operation of industrial control instruments used on furnaces, boilers, etc.
Machine-tool operations: Lathes and shapers used to machine bars of steel to be subjected to tests in physical laboratory.
Chemical analysis of paints, oils, metal chips, etc.
Metallurgical laboratory work: Polishing steel specimen, analyzing steel specimen under laboratory microscopes, Rockwell hardness testing.

Service and Maintenance.

Service and maintenance workers, including watchmen, guards, elevator operators, chauffeurs, matrons, janitors, cleaners, truckers, laborers, yardmen, chipmen, oilers, millwrights, carpenters, electricians, masons, plumbers, and steamfitters, were always a large labor group, constituting 8 percent of the total plant and office workers and 37 percent of the factory nonproductive workers (see table, p. 5).

Women were employed as matrons and janitors, and one plant had just hired four as guards. An arsenal that had no women as machine operators on production employed them on some other rather unusual types of work in which more and more women undoubtedly will be employed as the war continues. For instance, women drove "shop mules" used for hauling wagons and carts around the grounds and shops, and Clark carloaders for transporting boxes, piling them, and loading freight cars. Women were also making wooden packing boxes, operating band saws and nailing together the boxes.

Factory Clerical.

Some factory clerical workers are included in the departmental segregations shown in the table, page 5, these being charged to the departments together with the regular production workers. It was not possible in all cases to subtract the factory clerical from the actual production workers because the numbers were not reported, but a surprisingly large number still were men because some plants had employed only men for this work up to the time of the war. Both men and women worked as shop checkers, timekeepers, blueprint file clerks, and general clerical workers.

In addition to these factory clerical workers there were others in offices attached more closely to the factory proper than to the general administrative offices. These included safety, efficiency, production-control, methods, and production-engineering departments. Eighty-eight percent of such employees were men, which indicates the extent to which women can still be brought in to replace men even for factory office work.

CANNON OR GUN MANUFACTURING AND THE EMPLOYMENT OF WOMEN

Two firms making cannon or guns, including heavy coast-defense guns, railway artillery, howitzers, mortars, antitank guns, and anti-aircraft guns, employed respectively 5 percent and 14 percent women; the third, manufacturing chiefly small arms but some small cannon (37-mm.), employed 18 percent women in the entire plant. Women naturally could do more of the work on small cannon than on large-caliber guns, and it was estimated that as high as 40 percent of the employees might be women in cannon manufacture as a whole.

The two plants with 14 and 18 percent women employed them on an extensive array of machine-tool operations on production work and in tool rooms, on filing, burring, polishing, and inspection. They worked on small minor components for large-caliber cannon and on major as well as minor components for 37-mm. cannon, the smallest manufactured. Men still were doing much of the same or similar work, and plans were to employ more women on jobs vacated by men and on new jobs in the general expansion program.

The plant with the lowest percentage of women was in the initial stages of employing them as factory workers. It had started a pre-employment training program for women and had surveyed the shops for prospective jobs with the intention of using women wherever possible. A preliminary report showed that this would include various machine-tool operations, filing, burring, piece marking, inspection, light subassembly, crane operating, tractor and truck driving, and stock-room and tool-crib work. They would do rough turning operations on some barrels with one man to every four or five women to do the heavy lifting. In the metallurgical laboratory where gun specimens are prepared for analysis, women will be used on hacksaws, lathes, centering machines, automatic thread grinders, thread millers, and cylindrical grinders.

MACHINE OPERATORS

Large-Caliber Guns.

The machining of large-caliber cannon or guns such as 16-in., 14-in., 12-in., 155-mm., and 105-mm. involves the use of some of the largest heavy-duty machine-tool equipment found in any line of manufacture. Many of the machines had beds over 200 feet long and the large component parts often weighed thousands of pounds, requiring extensive use of mechanical handling equipment. Even with mechanical handling devices there was so much inevitable heavy manual labor in connection with the use of large hand tools, clamping of parts into machines, and manipulating of controls that it would be difficult to employ women on much of this work under any conditions. No

women were working on the heavy-duty machines in the big-gun shops and it was considered one of the last places where women could be employed.

The heavy-duty machines were used for turning, boring, reaming, grinding, and rifling such major components as the tubes, liners (inner tubes), hoops, jackets, breech rings, breech blocks, and rails. The built-up guns assembled by the "shrinkage method" must be finish-machined after they are cooled and this involves finish boring, rifling, chambering, and machining the breech end.

Typical heavy-duty machines in big-gun shops

Bement-Pond special machines for turning, reaming, rifling, etc.
Barnes horizontal drill.
Sellers horizontal boring machine.
LeBlond gun-boring machine.
Bullard vertical boring mill.
Giddings & Lewis boring mill.
Newton vertical milling machine.
Cincinnati vertical milling machine No. 4.
Milwaukee milling machine (heavy duty).
Sundstrand slab miller.
Cincinnati-Bickford radial drill.
Ingersoll planer.
Lapointe broach (large).
Mattison surface grinder.
Blanchard grinder.
Bryant internal grinder.
Jones & Lamson turret lathe (heavy duty).
Lodge & Shipley turret lathe (heavy duty).
Warner & Swasey turret lathe (heavy duty).

37-mm. Cannon and Small Components for Large-Caliber Guns.

Though women did none of the machining of large major components for big cannon, they did some work on smaller parts such as in the breech mechanism and firing mechanism, and on the larger as well as small parts for 37-mm. cannon, the smallest gun manufactured. Men and women often worked on identical or very similar operations.

Typical machines operated by men and by women (greatest numbers of women on those starred)

*Cincinnati milling machine Nos. 0–8 and 1–12.
*Cincinnati vertical milling machine Nos. 2 and 3.
*Brown & Sharpe vertical milling machine No. 2.
*Brown & Sharpe milling machine Nos. 2, 10, and 12.
*Milwaukee milling machine Model H.
Sundstrand Rigidmil.
Cincinnati Hydromatic milling machine No. 3–24.
*Nichols hand mill.
Taylor & Fenn spline mill.
Pratt & Whitney profiler No. 12.
Cincinnati automatic profiler (single and multiple spindle).
Taylor & Fenn Colt shaving machine.
Pratt & Whitney shaving machine.
*Drill press: Avey, Delta, Allen, Sigourney, and Edlund (single and multiple spindle).
Henry Prentice surface grinder No. 3–B.
Norton surface grinder 6'' x 18'' and 6'' x 30''.
Brown & Sharpe plain grinder No. 3.
Hanchett surface grinder.

Blanchard surface grinder.
*Gisholt turret lathe Nos. 3 and 4.
*Warner & Swasey turret lathe Nos. 2–A, 3, and 4.
Bardons & Oliver turret lathe No. 2.
*Hand screw machine (small).
*Monarch engine lathe 16" and 18".
Lodge & Shipley engine lathe 18".
Brown & Sharpe automatic screw machine Nos. 0G and 00G.
Brown & Sharpe Wire-Feed screw machine.
Lapointe screw type broach.
Fellows gear shaper.
Gould & Eberhardt shaper.
Smalley-General Co. thread hobber No. 20MB (large).

This array of machines covers practically every type used except a very few heavy-duty machines on which no women were employed. The machines most commonly operated by women were the small and medium-size milling machines, hand milling machines, hand screw machines, small and medium-size turret lathes and engine lathes, and drill presses. The women selected to work on the large turret lathes and profilers generally were the taller and more robust, so that they could reach the controls and exert the necessary force required in manipulating the levers, handwheels, and turnstiles. One plant manager spoke very highly of the success of women on profiling, saying they had a good sense of touch and allowed the machine to cut at a normal speed rather than forcing the cutter as men were sometimes inclined to do.

There was not the same volume of production of parts of one kind in cannon manufacturing as in small-arms manufacturing, so the machine operators had to be somewhat more versatile in shifting around on different work and making occasional machine set-ups. Women as well as men did this, including the setting up of machines, which more and more women were being trained on the job to do. The machine operators checked their own work with calipers, micrometers, and fixed gages; sometimes they did filing and burring of parts. The extent to which they did filing and burring depended on the length of the machining cycle and the number of machines operated. Very often one person operated three to six machines, either keeping them all running at once and constantly loading and unloading parts, or taking each part and performing a series of operations on one machine at a time.

Women did none of the barrel work on large-caliber guns, but they did reaming on 37–mm. barrels, operating LeBlond barrel-boring machines. Men loaded and unloaded the machines while women acted as operators, watching the controls and oil coolants and checking the proper functioning of the machines. With the aid of movemen women could perform the majority of the machine operations on 37-mm. barrels.

Major operations on 37-mm barrels, some performed by women

Facing-off and centering ends.
Barrel drilling, Pratt & Whitney barrel drill.
Rough and finish reaming using wood packed bits.
Rifling by the disk method using a series of disks, each a bit larger than the preceding, the operator putting a new one on at the end of each stroke through the full length of the barrel.
Chambering the breech end for the cartridge.
Honing.

Turning breech end on a lathe.
Thread milling breech end.
Milling cartridge clearance slot on vertical power mill.
Grinding external portions of the barrel.
Milling wrench flats on vertical miller.
Barrel straightening on Farquhar straightening press.

There still was opportunity for employing many more women on machine work on small and medium-size parts, as men often were employed on the second and third shifts to do work performed by women on the first shift, or men and women on the same shifts were doing work that was similar. In a Canadian plant visited that made 40-mm. antiaircraft guns, 30 percent of the machine operators were women and many more were to be employed, which is somewhat indicative of the proportion of machine work women can do on smaller cannon.

BURRING, FILING, AND POLISHING

In cannon manufacturing as in small-arms making there is a great deal of filing, burring, and polishing of parts by means of files, scrapers, disk grinders, emery cloth, belt sanders, portable burring tools, emery wheels, and rag wheels. Much of the work done by women was the same as that done by some men, but men did a larger proportion of the heavy work and more precision filing. Women worked mainly on small parts but did some filing and burring on heavier parts such as the breech rings and breech blocks for 37-mm. cannon, the spline shafts and breech blocks for 75-mm. and 3-in. cannon, and the breech end threads on 90-mm. barrels. Most of this work was done at benches with the workers seated, but some was done in a standing position when the parts were so large that they had to be mounted on a stand.

ASSEMBLY

Large-Caliber Guns.

After the hoops, tubes, liners, rings, and jackets for large-caliber guns are machined to proper size they are assembled into a compound cylinder by a process known as "shrinkage," the number of component cylinders depending on the design and caliber of the gun.

For example, the two-piece gun is assembled by shrinking the outer cylinder (jacket) onto the inner cylinder (tube). The inside diameter of the jacket is made slightly smaller than the outside diameter of the tube. The jacket is expanded by heat until it fits over the tube. Then, as it is cooled, the jacket shrinks into place, the process putting the tube into a state of compression, and increasing the elastic strength of the gun . . .[4]

A summary of the assembly of the typical 16″ howitzer follows:

The tube (B tube), filled with water, is placed in the shrinkage pit, breech end down, and supported in a vertical position. The expanded heated jacket is lowered over the tube until seated upon its shoulder. Cooling is effected by the use of encircling water sprays directed on the point where the first shrinkage gripping is desired, and then gradually moved upward. After the assembly has cooled to shop temperature it is removed from the shrinkage pit, the correct shrinkage verified by measurements, and the exterior surface finish machined for the next assembly operation. The successive preparation of the various hoops and rings, and their assembly, follows the same procedure outlined for the

[4] Hayes, Col. Thomas J., Elements of Ordnance, 1938, p. 161.

jacket and tube. The bore of the assembled gun is now finish bored and taper reamed to receive the liner.[5]

After the liner has been inserted into the compound cylinder the assembled gun must be allowed to cool, and this sometimes takes a week or more before it can be finish machined. The gun pits where this assembly takes place are huge depressions in the floor of the big-gun shops, with platforms built around the pit. Much mechanical handling equipment is used to move the tubes, hoops, rings, and so forth, and much of the work is heavy, hot, wet, and slippery. No women were employed in this phase of assembling built-up guns and it would not be feasible to employ them because of the manual tasks involved. However, on the breech mechanisms and firing mechanisms of heavy guns there are lighter subassembly operations that women could do.

Small and Medium-Size Guns.

On the assembly of small and medium-size guns such as the 37-mm., 75-mm., 3-in., and so forth there are filing, burring, fitting, and subassembly of small parts and attaching of parts to the breech mechanism and firing mechanism, all of which women could do. The men now doing this perform both light and heavy tasks, but the light operations could be segregated for women.

INSPECTION

In all the cannon plants women were scattered throughout the shops on detailed-parts inspection, and ultimately they were to do a much larger proportion of this work. Most of the inspectors used precision measuring instruments such as micrometers, calipers, gages, and scales; some were required to read blueprints. Frequently inspection was accompanied by a certain amount of filing, lapping, and fitting of parts to fixed gages. The women not only checked parts in process but did final inspection on parts prior to passing them on to the Government ordnance inspectors. In the heat-treat departments they did Rockwell hardness testing.

PACKING

Spare parts for replacement purposes are shipped with each gun, and women were greasing these small parts, wrapping them in oil paper, packing them into cartons and packages. Women assisted with the greasing and placing of protective paper coverings over the breech end of 75-mm. and 90-mm. barrels preparatory to shipping. Much of the cleaning, greasing, and packing of parts for cannon is heavy work and not suitable for women.

PARKERIZE, HEAT TREAT, SANDBLAST, BARREL TUMBLE, AND PAINT

No women were employed on parkerizing, heat treating, sandblasting, barrel tumbling, or painting of parts. Barrel tumbling for bur-

[5] Ibid., pp. 207–208.

ring small parts involves lifting big containers and is chiefly work of a manual nature. Sandblasting involves working in a standing position constantly holding and turning the parts by hand during the sandblasting process, which requires considerable strength. Much of the heat treating is very heavy work and requires a knowledge of methods of treating various metals, and the operation of different types of furnaces, temperature controls, and so forth. Women could do the parkerizing and spray painting of smaller parts.

FACTORY NONPRODUCTIVE JOBS

Tool Room (Tool Making).

As already pointed out, a significant trend in women's employment is the extent to which they are being introduced to tool-room work, a field formerly dominated by men and one that was considered untenable for women at the inception of the present war program. In the plant making the largest cannon and employing the greatest proportion of women, 20 percent of the women employed as machine operators were working in tool rooms making end mills, broaches, reamers, milling cutters, and so forth. They were taken in on the same basis as men, being expected to learn to set up their own machines and develop enough versatility to shift around on different types of work. Where heavy lifting was involved movemen were provided. At first there had been strong opposition to bringing women into the tool rooms, but the foreman found that women could do practically any type of work if given the time to develop necessary skills.

Typical machines operated by women were: Monarch engine lathe 14-in., 18-in., and 20-in.; LeBlond engine lathe 16-in.; Milwaukee milling machine No. 1–B; Brown & Sharpe universal mill No. 2; abrasive surface grinder No. 1½; Heald rotary grinder; Ott tool grinder; Oliver Instrument Co. tool grinder; Cincinnati tool and cutter grinder No. 2; Bryant internal grinder No. 16; Landis cylindrical grinder; Hendy shaper; and Cincinnati shaper. Women were not used on the heavy-duty milling machines, vertical boring mills, heavy-duty grinders, and planers.

Tool Cribs and Stock Rooms.

In all the cannon plants women worked as tool-crib and stock-room attendants checking in parts, placing them in proper cribs or boxes or on shelves, checking out parts, and keeping records. In some of the tool cribs women did a certain amount of grinding of milling cutters and reamers.

Gage Inspection.

A somewhat new field of employment for women is gage inspection, which requires skill and a considerable knowledge of mathematics. Only college graduates had been employed for this work and they had been very carefully selected. The women were placed first on the simpler work of inspecting plug gages, thread gages, ring gages, and so forth, but were to be trained for checking dies, jigs, and fixtures. They used vernier height gages, vernier depth gages, vernier calipers, universal surface gages, dial indicators, Johansson gage blocks, and other precision measuring instruments.

Crane Operators.

Cranes and other mechanical handling equipment are used extensively in the big-gun shops because of the extreme weight of parts and materials. One of the plants had 20 women employed as crane operators, another was in the process of taking women on for this work, having employed them on cranes at the time of the earlier war. The women were reported as enthusiastic over this work and had demonstrated their ability to do it well, gaining the confidence of the men in the shops, which is highly important in crane operating.

Factory Clerical.

Women were doing both tracing and drafting in the engineering and tool-design departments and more were to be placed on such work. Men had formerly done most of the factory clerical work but some had been replaced by women coming in as shop clerks, production-control clerks, timekeepers, stock clerks, and so on. However, there still were many men in such positions who could be replaced by women.

RATES OF PAY, HOURS OF WORK, PERSONNEL PRACTICES, AND TRAINING

RATES OF PAY

Occupational Rates Rather Than Rates by Sex.

The basing of rates on occupation rather than on sex has been revived as a pressing issue as it was at the time of World War I, when so many women were brought into all phases of the war program.[6] Also in line with events of that war, the National War Labor Board has made an official pronouncement that—

> Wage rates for women shall be set in accordance with the principle of equal pay for comparable quantity and quality of work on comparable operations.

Small-arms and cannon manufacturing establishments have been among those materially involved in this issue because so many women have been brought into plants formerly manned almost 100 percent by men, with little or no change in the physical characteristics of the jobs. As women have become more and more an integral part of the productive force, the wage-differential problem has become increasingly acute from the standpoint both of the women hired and of the men leaving for the armed services.

In considering the comparative similarity of work done by men and women, more than the physical characteristics of the job must be analyzed. Benches or machines may be raised or lowered to reduce weight lifting, operations may be broken down to segregate the light work from the heavy, automatic stops may be placed on machines to reduce the skill required, new fixtures or arbors may be designed to lighten the work, additional movemen may be hired to eliminate material handling by machine operators. These innovations may actually increase production and decrease unit costs, and do not serve as warrant for lower wage rates for participating workers. All-over production costs as well as the physical characteristics of the work as performed by women instead of men must be taken into consideration in contemplating rate changes. Only if there are substantial changes in job content and material increase in total labor costs is there a legitimate reason for proportionate wage adjustments, in the opinion of the National War Labor Board.

Three of the eight plants covered in the survey had adopted the principle of equal pay, the minimum entrance rates and the job classification rates being the same for men and women. In one, new workers were advanced in two or three months from a "mechanic-learner" classification to a job classification, with succeeding wage increases based on efficiency ratings. In the second plant, the majority of productive workers were on piece work, making increases in earnings dependent on individual output. The inspectors and non-

[6] U. S. Department of Labor, Women's Bureau, "Equal Pay" for Women in War Industries. Bulletin 196. 1942.

productive workers were on time work and rate changes for them were largely on an individual basis. The third plant conforming to the equal-wage principle had salary reviews about every 6 months with a system of salary increases based on upgrading.

Women's Rates Versus Men's Rates.

The minimum entrance rate for women in the eight plants ranged from 39 cents to 60 cents, the range for men was from 39 cents to 75 cents, with 50 to 55 cents the most common minimum beginning rate for both. Three had the same entrance rates for men and women; in the others these rates were from 5 to 15 cents an hour less for women than men, as shown below:

Men (cents)	*Women (cents)*	*Differential (cents)*
53	43.4	9.6
75	60	15
55	50	5
69	54	15
50	39	11
39	39	--
50	50	--
50	50	--

One plant in the State of Michigan, where wage discrimination between the sexes is prohibited on work of "like value, workmanship, and production," classified all operations as either "male" or "female" and employed only men on "men's" jobs and women on "women's" jobs. According to standards established by management the specific operations performed by women were not the same as those done by men, though further analysis would be necessary to determine whether jobs were of "like value." There were varying occupational classifications and wage rates for work done by men, but all "women's" jobs fell into one wage classification of 60 to 76 cents an hour irrespective of the type of work performed, whether machine operating, assembly, or inspection.

A second plant with sex wage differentials had a flat rate of 43.4 to 47 cents for all women in the factory except inspectors, who had a higher rate. The women did all types of machine work, assembly, filing, and burring, much of which was identical with or comparable to that done by men, some of whom received 61.4 to 67.4 cents an hour and others of whom received 69.8 to 75.8 cents an hour.

Another plant had an elaborate breakdown of job classifications with lower rates for all "female" job designations though there was no question that the work done by women was comparable in quality and quantity to that done by men. In all cases the maximum rates for women were lower than the minimum rates for men on the same work, as is shown in examples of day rates on page 31.

These rates applied to day workers and not to those on piece work. Approximately 60 percent of the workers were under a piece-work system at the time of visit and more were to be added. On such jobs the wage differentials were eliminated because the same piece price applied to both men and women. To eliminate sex differentials among the day workers a job analysis was being made to ascertain if women were doing work comparable to that of men; then necessary wage adjustments were to be based on the job irrespective of the sex of the worker.

Occupation	Men		Women	
	Minimum	Maximum	Minimum	Maximum
Assembler	$5.60	$6.24	$4.72	$5.20
Assembler—Helper	5.04	5.68	4.16	4.64
Barrel rifler	6.56	7.52	4.72	5.20
Benchwoman and benchman	5.60	6.24	4.16	4.64
Benchwoman and benchman—Helper	5.04	5.68	3.92	4.40
Material keeper	5.92	6.72	4.72	5.20
Mechanic-learner	4.00	(1)	3.12	(1)
Operator machine:				
Automatic screw	6.72	7.68	4.72	5.20
Driller	5.92	6.72	4.72	5.20
Grinder	5.92	6.72	4.72	5.20
Miller	5.60	6.24	4.72	5.20
Profiler	5.92	6.72	4.72	5.20
Punch press	5.92	6.72	4.72	5.20
Shaver	5.92	6.88	4.72	5.20
Junior operator machine:				
Driller	5.04	5.68	3.92	4.40
Grinder	5.04	5.68	3.92	4.40
Miller	5.04	5.68	3.92	4.40
Profiler	5.04	5.68	3.92	4.40
Shop inspector	5.60	6.24	4.40	4.88

[1] Single rate.

Methods of Wage Payment.

Three of the seven plants reporting had a straight time-work system of wage payment throughout the plant. The others had various types of piece work, incentive, and bonus systems: Group bonus with guaranteed base rate, individual bonus with guaranteed base rate, and straight piece work with no guaranteed base rate. These incentive and piece-work systems applied to productive workers and not to nonproductive workers nor inspectors; in some cases they did not apply to all productive workers. Under an incentive system where a standard time is set for performing a certain operation, pay is received for the time allowed even if the work be completed in a shorter time; for example, 10 hours' pay could be received for 8 hours' work. But the hours earned are applied to the worker's base rate, so this system does not eliminate any existing wage differentials between men and women.

HOURS OF WORK

As a means of augmenting wartime production, most plants were kept operating 24 hours a day, 7 days a week. This gave rise to much fluctuation in hours and shifts in an effort to keep the output of various departments timed properly, to allow maintenance men to service and repair machinery, to make the fullest use of supervisory staff and skilled workmen, and to keep the working hours of women within the statutory requirements of the respective States. In one plant there were 18 different working schedules, which gives some idea of the complicated arrangements necessary in both office and factory hours.

Work schedules were not always based on a 7-day week, but might be on an 8-day or a 6-day week, with allowances for 2 days off after 6 days of work, 1 day off after 5 days of work, 1 day off after 20 days of work, and so forth, thus complicating greatly the computation of hours worked in a 7-day week. There were often differences in work schedules among the men, those more highly skilled working longer

hours because of shortage of such workers as tool and die makers, jig and fixture makers, and machinists. Swing shifts were common, with days off varying each week over an 8- or a 6-week cycle. Sometimes it was necessary to have shorter work schedules for women due to State laws restricting their hours, but usually the States would grant special emergency permits relaxing slightly the hour and night-work provisions.

The work schedules for women in the 8 plants visited were not uniform; three plants had an 8-hour day and a 48-hour week; one had a 47-hour week, 7½ hours on 5 days and 9½ hours on 1 day; one had a 7½ -hour day and a 45-hour week; one had a 48-hour week for 5 weeks and a 40-hour week for 1 week. One plant had some women on a straight 54-hour week (10 hours on 5 days and 4 on 1 day), and other women on a 50-hour week (10 hours on 5 days) for 6 weeks and a 60-hour week (10 hours on 6) for 2 weeks; the eighth plant had some women working an 8-hour day (56 hours a week), with 1 day off in 21, and others working a 9-hour day and a 54-hour week.

Most plants started with women on the day shift and the majority of women still were on that shift. The number employed on the night shifts was gradually increasing with the expansion in women's employment.

Four of the plants had a 30-minute lunch period for which no pay was received, three allowed 10 to 20 minutes for lunch for which there was no pay deduction, and the eighth plant allowed either 30 minutes without pay or 20 minutes with pay. Frequently those with only 10 or 20 minutes were expected to eat at their jobs if the nature of their work was such that this was possible.

In only one of the plants was there a formal rest period for women of 10 minutes in the morning and 10 minutes in the afternoon; in the others women usually were allowed 5 to 10 minutes or a reasonable time away from their work twice in each workday. This was not an officially proclaimed rest period but merely something allowed by management as long as women did not abuse the privilege.

PERSONNEL REQUIREMENTS, POLICIES, AND PRACTICES

Women in Personnel Work.

Most of the plants visited had one or more women handling personnel relations among the factory women and looking after their general welfare. Some worked in conjunction with the employment office, interviewing women applying for factory work, spending time in the plant seeing that the women dressed properly and observed shop rules and regulations, checking wash rooms and locker rooms, and giving counsel on complaints and questions. Others did only interviewing of the applicants, instructing them as to factory procedures, work clothing, safety rules, and assigning the work to which they seemed best fitted, while a matron or forelady stayed in the factory, watching the locker rooms, checking the clothing of the women, and so forth. Those called "foreladies" usually had nothing to do with the selection and hiring of the women, but checked quite closely on their efficiency and progress on the job, watched their conduct in

the plant, and saw that safety-clothing measures were observed. Usually those with some background in factory work were selected as "foreladies," as having a better understanding of the problems that arise.

It was considered advisable to have women acting in these capacities because the factory women found it easier to bring their problems to a woman than to a man. Then, too, a woman would understand better than a man the extent to which shop morale and harmony can be bolstered by small service-facility appointments and working conditions on the job that may mean a great deal to a woman getting an introduction to plant life, possibly for the first time.

Age.

A minimum age limit of 18 years was most common, with no maximum except in the case of two plants where maximums were set at 45 and 55 years. One arsenal had an 18-year minimum for women on "classified labor" but would take those of 16 years for work as "shop girl" or "machine operator trainee" providing the employment of 16-year-old girls was not in conflict with law.

Marital Status.

Marital status of the women was reported as immaterial in all but one of the plants, and this plant was intending to rescind its ban on married women. It was just as common to hire married women as those single. In one plant 70 percent were married; in another 50 percent to 60 percent.

Medical Examinations and Medical Facilities.

Most modern industrial establishments in this country have taken pride in developing model medical facilities for caring for their workers, and more and more emphasis is being given to the importance of preemployment physical examinations in selecting workers. All plants covered in this survey had medical departments for first-aid treatment and preemployment physical examinations. Most of the examinations were quite rigid, one firm even requiring that new employees be vaccinated against smallpox. The more elaborate of medical departments had a surgery for emergency operations, examination rooms, treatment rooms for various types of injuries and treatment, X-ray and dark-room equipment, laboratories, and wards for patients who could not be moved for a matter of hours or a day or two. The arsenals had post hospitals with a staff of Army doctors and nurses, and first-aid stations out in the factory buildings.

Education and Experience.

The Government arsenals had to select their workers from Federal Civil Service registers, and a "mechanic-learner" register usually was set up for women seeking factory employment. Two arsenals required a mechanical-aptitude test but had no education or experience requirements for mechanic learners, and one did not require a mechanical-aptitude test but asked for 8 years of grammar school or 3 months of any kind of manual work. In the fourth arsenal three different registers were set up for women: One for "shop girls," requiring elementary schooling and 3 months of manual work or 2 years of vocational or high school with no written examination; a second for

"classified laborer" requiring four grades of schooling and 6 months of manual work with no written examination; and a third for "machine-operator trainee" requiring 250 hours in a VEND [7] course or some vocational school but no written examination.

There were no specific education requirements for employment in the four private plants covered, but it was an advantage to have as good an educational background as possible. Three did not require experience but preference generally was given to those with shop experience because they were accustomed to factory environment and shop practices. The fourth plant required factory experience in related types of work or completion of a defense training course in machine shop or inspection.

Uniforms.

Only two of the plants required a standard work uniform, the first a two-piece blue uniform with a visor cap to match that could be purchased at a local store for $3.50, and the other a white smock uniform provided by the company. A third plant was planning to require the women to wear a standard uniform. The remaining plants generally required low-heeled closed-toe shoes, slacks or coveralls of the worker's choice, and a head covering of hair net, cap, or bandanna. Slacks were not always specified, but instead any clothing that was not loose around the sleeves or waist. Goggles, eye-shields, and respirators usually were provided where needed.

A problem almost always raised was the great difficulty in getting women to wear a head covering, or to get them to wear the head covering properly instead of on the back of the head with the front hair exposed or in a loose-fitting fashion with hair hanging out all around. Even in plants where there had been serious accidents due to women getting their hair caught in high-speed machinery, the women had not taken heed and were careless in their hair dress. The only solution to such a condition is a rigid enforcement of rules regarding hair dress in the interest of plant safety, even to the point of discharging those not conforming.

Food Service.

Providing adequate food-service facilities for a multitude of workers in a large factory, perhaps composed of several buildings, has become a pressing problem. With lunch periods limited to 10, 20, or 30 minutes the cafeterias or lunch wagons must be so located that the workers can wash and be served in very few minutes, but this is often difficult. Even where there is a cafeteria for serving hot food many workers prefer bringing their own lunches to going some distance to the cafeteria and then having to stand in line. Lunch stands or cafeterias should be so located as to be fairly convenient to all workers, or more time should be allowed for lunch.

Six of the eight plants had cafeterias, and one of them had in addition sixteen food trucks serving those not having time to go to the cafeteria. The trucks served a few hot dishes such as soup, beans, and sphaghetti, as well as sandwiches, ice cream, and candy. Two of the six plants had vending machines for cold drinks, candy, fruit, and so forth. One of the remaining plants made no provision for serv-

[7] Vocational Education for National Defence.

ing hot food but sent mobile canteens through the shops at noon selling milk, sandwiches, small pies, candy, nuts. The workers were allowed 10 to 20 minutes for lunch but were supposed to eat at the job if possible. The eighth plant had neither cafeteria nor canteen service, but plans had just been approved for constructing food stands in various shops where sandwiches, coffee, and some hot food would be available.

TRAINING

Training Within the Plant.

With the sudden increase in small-arms and cannon manufacture necessitating the hiring of great numbers of unskilled workers with little or no experience, the most workable procedure has been to give them on-the-job training. Time has not allowed training people as "all-round workers," nor has that been necessary where the volume of production has increased so that workers can be confined to a single type or a few types of work. A new employee usually was placed under the guidance and instruction of an experienced worker, leadman, or foreman to observe an operation and gradually try to do the work. In this way, on the majority of operations a fair degree of proficiency could be attained in from half a day to two weeks. If the use of calipers, micrometers, and gages and the reading of blueprints were required these were taught right on the job. Most plants visited followed this informal on-the-job method of training, with no formal classroom instruction.

Two plants had formal programs of training for women within the plant. One used the facilities of the men's apprenticeship training school for an initial orientation program to acquaint the women with shop atmosphere and teach them the fundamentals of machine operating. The time spent in this school varied with the individual's aptitude and the demand for new workers in the various shops. The trainees were paid for the time spent in school. The other plant required women to take preemployment training in a National defense training school, and after finishing this 2-to-3 months' course they were brought to the men's apprenticeship training school in the plant and taught the specific task they were to do in the factory.

Supplementary or part-time training in the plant for women already employed was uncommon, there being only one plant that had classes in blueprint reading and use of precision measuring instruments for the men and women working as inspectors.

Preemployment and Supplementary Training Outside the Plant.

In most of the areas where plants were visited preemployment training courses in machine-shop practice and inspection were available for women in National defense training schools or regular vocational schools. The training programs usually were set up to meet the needs of all plants in the area rather than the specific needs of any one plant. Only one plant required women to have preemployment training, but two others frequently used training schools as a source of women workers. One estimated that 50 percent of the women it employed had had three months' preliminary training.

The one plant requiring preemployment training for women plied this only to machine operators and not to assemblers, insp tors, tool-crib attendants, and so forth. Very few women were tually employed at the time of the visit, but over 100 were in tra ing and hundreds more were to be trained. Length of training was somewhat contingent on individual progress but the usual period was two to three months. Two hours a day was spent in classroom work and 6 hours on shop work, learning the operation and machine setting on drill presses, milling machines, engine lathes, turret lathes, grinders, shapers, and planers. The students were taught shop mathematics, blueprint reading, use of micrometers, calipers, and gages, filing, burring, heat treating, and the sharpening and grinding of tools.

Very little supplementary part-time training in schools outside the plant was given to persons already employed, and any such training was primarily for foremen, leadmen, and supervisors. One plant was intending to arrange for supplementary training classes for women in nearby defense training schools.

○

August

Plants in Machine-Tool Industry surveyed by
W. B. agents in summer of 1942

Name of plant	Location
✓ Barber & Coleman Co.	Rockford, Ill.
Barnes Drill Co.	Rockford, Ill.
Barnes, W. F. & John	Rockford, Ill.
✓ Brown-Sharpe Mfg. Co.	Providence, R. I
✓ Cincinnati Milling Co.	Cincinnati, Ohio
Cleveland Automatic Machine Co.	Cleveland, Ohio
✓ Fellows Gear Shaper Co.	Springfield, Vt.
✓ Jones & Lamson	Springfield, Vt.
Kingsbury Machine Tool Co.	Keene, N. H.
✓ Lapointe Tool Co.	Hudson, Mass.
✓ Le Blond Machine Tool Co.	Cincinnati, Ohio
✓ Monarch Machine Tool Co.	Sidney, Ohio
Norton Co.	Worcester, Mass.
~~Pratt & Whitney~~	Hartford, Conn.
Reed-Prentice Co.	Worcester, Mass.
~~Republic Drill & Tool Co.~~	Chicago, Ill.
Warner-Swasey Co.	Cleveland, Ohio

NOTE: 15 the above plants were included in the report,
"Employment of Women in the Machine-Tool Industr

In "✓" plants, women were employed on factory jobs.
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OF TRANSMITTAL

STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, May 15, 1943.

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MARY ANDERSON, *Director.*

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LETTER OF TRANSMITTAL

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, May 15, 1943.

MADAM: The machine-tool industry is illustrative of an industry in which many women may be substituted for men. Until recently the industry has employed no women wage earners. Because machine-tool building was basic to the development of munitions industries, and because its previous methods of production called for highly skilled workmen in the first war years, united effort was exerted to keep the original skilled staff and to add thereto other skilled mechanics. Now even though the total amount of employment has reached a peak, there will be need for the replacement of men by women.

This survey of the machine-tool industry indicates that today there are many jobs in machine-tool building that are similar to those women are carrying on efficiently in other industries. That the industry also recognizes this fact is evidenced by monthly reports of increase in the employment of women wage earners since our technicians studied the industry.

The plant surveys were made by Martha J. Ziegler and Margaret Kay Anderson. The report has been written by Dorothy K. Newman and Miss Ziegler.

Respectfully submitted.

MARY ANDERSON, *Director.*

Hon. FRANCES PERKINS,
Secretary of Labor.



—COURTESY BROWN & SHARPE

WOMAN PERFORMING OPERATION IN THE SKILLED ASSEMBLY OF A SURFACE-GRINDING MACHINE.

PROSPECT, MAY 1943

In the period it has taken for the data to be collected and this report to be prepared and published, machine-tool firms have made extensive progress in the employment of women. Some of the companies that at time of survey were resisting the hiring of women in the shop have already taken on hundreds. It is not at all uncommon today to find that in plants with 2,500 or more workers, from 12 to 20 percent are women.

The following analysis and the conclusions to which it points, however, are as valid now as before. The data continue to show that, even discounting plant differences in process and product, the occupations for which women are employed vary widely from company to company. Many plants employ men in jobs for which others are hiring women, and vice versa. This brings into relief two pertinent facts: (1) That, contrary to traditional notions, women can be trained under present conditions to handle successfully a wide variety of jobs in machine-tool manufacture, and (2) that opportunities for women in this industry are plentiful, assuming the interest and cooperation of management. The reason, in fact, that the pattern of women's occupational distribution in the industry continues so inconsistent and even haphazard is the extensive field over which women have been employed, no part of which has yet been fully exploited. For example, numbers of women were engaged in machine operations in some firms, but no women, or very few, were hired for similar work in others. Many jobs could be opened to women to perform various kinds of machining on machine tools and accessories. In a few plants women were doing a great deal of in-process inspection, but in most of the others they performed only a small proportion, if any. Subassembly work was women's chief job in one of the lathe factories, but this was considered unsuitable for women in several other firms where subassemblies were made.

Further illustration would only be redundant. It should be remembered, of course, that the employment of women, like that of inexperienced men, requires in many cases dilution of skills, involving also in some instances the introduction of handling conveniences. But it must not be forgotten that women, like boys and men employed now and in the past, become proficient with experience, and some are soon able to tackle more highly skilled and difficult operations.

In some quarters the employment problems of the industry that involve the necessity for extensive dilution of skills and the introduction of new and expensive equipment now appear less grave due to the threat of dwindling war orders. Though in the years before the war an annual machine-tool production worth $150,000,000 was considered good, in 1942 the industry's monthly output averaged practically three-fourths of this. However, from the very function of the business now, that of providing the basic tooling and retooling for the mass production of war material, output can hardly be ex-

pected to continue at such a remarkably high rate. The initial tooling-up has in many places been completed, and recent figures show that the industry is now catching up with its backlog. Not only are new orders no longer equal to shipments, but in addition there was an 11-percent reduction in output from December 1942 to January 1943. Production dropped again in February and was slightly lower in May.

This apparent trend has worried machine-tool manufacturers, since in many cases, even with extensive subcontracting, expansion in plant and other investment has been tremendous. They anticipate that soon they may have to convert all or part of their facilities to the manufacture of other wartime products. This uneasiness about the future doubtless has affected the attitude of some firms toward hiring women for the first time or adding to the numbers they already employ.

There is definite indication, however, that machine-tool orders will by no means cease when initial tooling has been completed. In the first place, it has been estimated that the backlog alone, if contracts are not cancelled, would keep the industry going at top speed into the summer of 1943. Actually, it may take even longer to clean up the backlog, since some of the largest companies with orders ahead are not now devoting all their energy to machine-tool production but have already taken on the manufacture of other products. Secondly, at the rate at which old and new machines have been used, thousands will have to be replaced. In many companies, furthermore, tooling for war production was done so hastily that old tools were accepted and new ones were designed in a hurry. Careful study of operations can now be gone into and designs made for better and more specialized tools, a great number of which will be needed as the war continues. The requirements of other countries remain high also.

On May 12, 1943, the War Production Board announced in a press release that "the United States at last has the machine tools * * * it needs to build production to defeat the Axis." This pronouncement, with its accompanying outline of a plan for pushing production of war material almost to the exclusion of facilities, makes more imminent the conversion of a large proportion of the industry.

As conversion occurs, however, the demand for women workers is likely to increase rather than decrease. Women can be absorbed in munitions manufacture in larger proportion than in machine-tool production, since the making of munitions involves straight mass production, in which women as inexperienced workers can participate much more readily and fully. Therefore, the possibility that a firm might have to convert later should not preclude the hiring of women now. The fact is that full utilization of the woman labor force in plants now devoted exclusively to machine-tool production has barely begun.

Employment of Women in the Machine-Tool Industry, 1942

SCOPE OF THE SURVEY

Machine tools are the basic tools of war production. Their use is essential in the manufacture, to very close tolerances, of the thousands of metal parts for guns, ships, tanks, planes, and countless other supplies and equipment upon which the armed forces of the United States depend. For this reason the production of machine tools had to be expanded rapidly before other production could get under way.

According to a statement released by the United States Department of Commerce in November 1942, the machine-tool builders of the country had produced more equipment in the previous 20 months than in 10 normally active years. The value of machine-tool output for the entire year 1942 reached the staggering sum of nearly 1 and a third billion dollars, or about 6 times the value of the 1939 output. Such a figure would have been almost inconceivable prior to the outbreak of war in Europe.

To meet the load of expanding production, employment also has increased until, according to a reliable estimate, the industry in 1943 has about 4 times as many workers as the average for 1939. The immediate employment problem, however, seems to be not so much a matter of finding the necessary labor for further expansion as of keeping what labor there is on the job and finding substitutes for men who enlist, are drafted, or move on to other war plants. To cope with this situation some employers already have taken on factory women in this traditionally male-employing industry, and top-flight executives are recommending that the practice be extended. The rapidity with which women have recently been absorbed into machine-tool plants may be judged from the fact that in 1939 they comprised less than half of 1 percent of the total wage earners in the approximately 200 plants engaged principally in making machine tools, whereas at time of writing the proportion is about 11 percent of a considerably expanded force.

In view of the industry's importance and recent expansion, the Women's Bureau of the United States Department of Labor made an investigation of machine-tool plants in the summer of 1942. This was in accordance with the Act of Congress creating the Bureau in 1920, which outlines its duties as follows: "It shall be the duty of said bureau to formulate standards and policies which shall promote the welfare of wage-earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment. The said bureau shall have authority to investigate and report to the said department upon all matters pertaining to the welfare of women in industry."

As in its other war-industry surveys, the purpose of the Bureau in its study of the machine-tool industry was to find out to what extent and in what jobs women were or would be employed by some typical firms, and to be able, on the basis of the kinds of work they were known to be doing successfully elsewhere, to make recommendations concerning the jobs in which the employment of women could be introduced or extended. Trained field agents interviewed plant executives, production superintendents, shop foremen, and personnel workers, and made a careful tour of each of the factories surveyed. In those plants where women had not yet been placed on productive occupations the work in the factory was closely observed and the problems involved in its performance were noted. Where women were engaged in productive work, Women's Bureau agents paid special attention to their occupations. Data were secured from each firm concerning the numbers employed, hours, wages, and other conditions of work, and personnel policies and problems.

Fifteen well-known plants, situated in recognized centers of the industry in New England and the Middle West, were visited. These plants differ greatly in size and make the principal machine tools, that is, milling machines; drilling, reaming, and honing machines; gear-cutting machines; broaches; grinders; and engine, automatic, and turret lathes. The 15 plants are engaged primarily in machine-tool manufacturing, and so come within the 1939 Census of Manufactures definition of that industry, namely, "establishments primarily engaged in the manufacture of power-driven complete metal-working machines not portable by hand, having one or more tool and work-holding devices, used for progressively removing the metal in the form of chips." This definition is in general accord with that of the United States Bureau of the Budget in its Standard Industrial Classification Manual, and of the War Production Board.

In the industry as a whole the production of lathes (including screw machines) far exceeds that of any other type of machine tool made, being two-fifths of the total 1939 machine-tool output. Next are the drilling machines, comprising about one-fourth of the units made, and after these come grinding and milling machines, which together are but one-fifth of the 1939 production.

Firms making machines "for the shaping, pressing, or forging of metal, where the shaping action of such machines is not dependent upon a cutting tool" are not included in the machine-tool industry. This would be true, for example, of factories making forging or stamping machines, presses, or die-casting machines. Excluded also are the firms whose chief products are machine-tool accessories or attachments, precision measuring tools, or small portable power-driven cutting and shaping tools.

visited, and products and company systems of organization differed,

Equally complete plant figures were not available in all plants so in some cases proportions of workers employed in various occupations are only approximate.

The total number of employees in the plants surveyed, computed from figures available at the time of visit, was approximately 45,000, well over one-fourth of the currently estimated total force of the industry. Though the proportions varied somewhat from plant to plant, about 85 percent of the workers in the 15 plants taken as a whole were in the factory, the remainder in office or sales work. In

the 13 plants reporting employment by department, only about 1 in 4 of those in the factory were in such occupations as shop clerk, janitor, cafeteria worker, trucker, packer, tool-crib attendant, toolroom worker, maintenance worker, laboratory worker, designer, and the like, commonly called "nonproductive." The others had jobs directly connected with the preparation, machining, inspection, or assembling of the product.

Five of the companies manufactured nothing but machine tools; 9 made machine-tool accessories or machinists' tools in addition; and 8, including 7 of those making accessories, manufactured some miscellaneous products not considered within the metal-working-machinery industries. In some plants employees were expected to work on various products, so distinction between workers on the basis of the end products they help to make was not always possible, especially among the nonproductive personnel who ordinarily service the plant as a whole. In none of the 10 companies where other products were made were so many as two-fifths of the employees engaged primarily in other than machine-tool production, and in 4 plants fewer than 5 percent of the workers were employed exclusively on such products. The accessories departments had more workers than the departments making products not in the metal-working-machinery classification. Altogether about 9 percent of the workers were primarily on machinists' tools or machine-tool accessories at the time of visit and not quite 3 percent were on other than machine tools and accessories. The accessories included, among a variety of other things, chucks, collets, jigs, fixtures, broaches, milling-machine cutters, reamers, gear cutters, and measuring tools and instruments. Some companies made these tools or attachments primarily for use on the types of machine tools they manufactured, some for the general trade.

NUMBER AND OCCUPATIONAL DISTRIBUTION OF WOMEN

The machine-tool industry is traditionally a man's industry. Of the nearly 45,000 workers in the 15 plants surveyed, only 3,544, or not quite 8 percent, were women, and almost 3 in 4 of the women were employed in the plant offices. Though all the firms had women in the office, even here women by no means predominated, comprising only about two-fifths of the total office force in all the plants combined. In 3 cases women were less than one-fifth and in only 2 were they more than half those on the office pay roll.

Eight of the 15 plants employed women as factory workers. This was, in most instances, an innovation due to the emergency. At date of survey, the summer of 1942, 2½ percent of all the factory employees in the plants visited were women, and the proportion in the plants where women were working varied from 2 to as much as 8 percent of the factory total. These ratios undoubtedly have increased since the survey, since officials in all the plants employing women factory workers said they were planning to hire more of them and, in addition, 6 of the 7 with no women factory workers on the pay roll at the time of visit were giving serious thought to their employment.

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One company not then employing women in the factory had made a careful analysis of all the jobs on the factory floor and had designated the ones it was thought women could fill; it had let a contract for women's rest-room equipment, and was ready to go ahead with the hiring, pending only the settlement of certain raw-material and machinery shortages. Another had made an occupational analysis and had estimated the numbers that might be hired. Most of them could tell roughly about how high the proportion of women factory workers in the plant might become, should women eventually be taken on, and all were interested in discussing women's employment, indicating in every case that there was at least a possibility that women would be hired in the future.

Factory and office employment of men and women in 15 machine-tool plants

Place of work	All workers		Men—Number	Women		
	Number	Percent of total		Number	Percent of group total	Percent of women's total
Grand total	44,853	100.0	41,309	3,544	7.9	100.0
In factory	38,216	85.2	37,279	937	2.5	26.4
In office [1]	6,637	14.8	4,030	2,607	39.3	73.6

[1] Includes 58 men in sales force, and machine installation and service,.

About four-fifths of the women found in factory work were in productive occupations such as machining, assembling, and inspecting. The others were primarily in shop clerical jobs such as timekeeping, stock chasing, production control, and the like, or were employed, to mention the more numerous, in service work and in the shipping and store rooms, the toolroom, and the tool crib. Three plants had more than 100 women each in production departments, and in one of these the women were more than 7½ percent of the productive employees.

Of the women in factory work, two-fifths were working primarily on machine-tool accessories or small tools and other products, rather than on the machine tools themselves. In fact, though women comprised less than 2 percent of the productive factory workers employed chiefly on machine tools, they constituted nearly 6 percent of the workers on accessories and 12 percent of those on other products. In four of the six plants where there were women working on other products they were half or more of the women factory workers employed. In the other two the women factory workers were engaged chiefly in making machine tools, most of them in such productive work as machining and inspection. It is significant also that two of the eight plants that reported women in factory work made nothing but machine tools, and, what is more, were among the first four companies in the proportion of women to total factory workers employed. The data prove, therefore, that women can be employed in substantial numbers in plants other than where accessories and other products are made. To be sure, differences in the kinds of machine tools they make affect the capacity of machine-tool firms to absorb women in their labor force. Consideration will be given this in the section of the report dealing primarily with occupations.

The foregoing discussion indicates in brief what will be brought out in more detail in a later section, that not only were women not employed to any great extent in the machine-tool industry at the time of the survey, especially in productive work, but where they were employed their occupational distribution showed little uniformity from firm to firm.

The reasons for this situation, besides differences in products and processes, are various. One of the most potent is the strength of tradition in the industry, heretofore a man's world. One personnel director stated, for example, that between the period of World War I and the present war emergency his company had made it a policy not to employ women in clerical jobs within the factory, that is, as department clerks, timekeepers, and the like. No women were permitted on the factory side of the wall, as it were. In fact, the bulk of all clerical jobs in the plants surveyed, whether in factory or office, still tended to be held by men at the time of visit, though this is work for which women have been employed elsewhere as a matter of course. Again, a plant reported specifically that one of the difficulties that had to be met there in connection with the employment of women was resistance from foremen. Where such traditions exist, not only is there the expected opposition on the part of workmen as well as supervisory personnel to efforts to introduce women, but also there are variations in the methods and speed with which the change is made. It is a curious thing that the amount of experience the management has had with women in factory work shows no discernible correlation with the degree to which the scope of women's employment has broadened as a result of the war emergency; three of the firms that have been most progressive in their employment policies in regard to women, opening to them a variety of productive jobs under liberal conditions for the acquisition of skill, had no women on production prior to the spring of 1942.

The adequacy of the male labor supply and the availability of women for factory work vary from area to area, so the different companies have not been affected equally by the generally tight labor market and some have felt less need to hire women. All those visited, however, had experienced a severe shortage of skilled male labor by the summer of 1942, and some were even having difficulty recruiting semiskilled and unskilled men. Many complained of high turn-over among their men, numbers of whom shopped around for other jobs, enlisted, or were drafted. Most believed the supply of woman labor adequate, even abundant. The fact is that when both men and women had to be trained for the job, though the turn-over among men was high, the tendency was to hire men if they could be had.

In some instances expansion in the labor force had occurred very early because of war orders from England, Russia, and France, and also because orders reached machine-tool plants before less basic industries. This gave some firms the opportunity to tap the labor market early for male employees. Some company executives said, for example, that several years ago their firms began taking on and training many young men. However, though these plants have been at an advantage for some time there is no guarantee that their men, still young, will not soon be transferred to the military services. Early in the emergency, when men were comparatively plentiful for the Army, local draft boards were willing to defer workers in machine-tool plants, but

in many cases this is no longer true. A number of the firms visited reported to Women's Bureau agents in the summer of 1942 that many of their men, even skilled workers, were being drafted, and an even larger proportion were expected to be called. Numbers were enlisting. This situation has been one of the chief reasons for employing women. One employment manager stated that the local draft board had urged him to begin hiring women.

In four of the States in which the machine-tool plants of the survey are located, Illinois, Massachusetts, Ohio, and Rhode Island, women's workweek is limited to 48 hours or less except by special permit. New Hampshire, also with a 48-hour law, licenses 54 hours during 8 weeks in any 6-month period, and in addition exempts the manufacture of munitions or supplies for the United States in wartime. One company in each of two States voiced the complaint that this restriction is an inconvenience when women are placed on men's jobs in productive factory work, since the men work longer hours, thereby necessitating two sets of work schedules and special synchronization of men and women with the jobs to be done and the machines available to do them. This complaint was made in response to a question concerning the possibility of extended employment of women. Several other firms visited, however—also in the States that limit women's workweek to 48 hours or less—all employ women in productive jobs. In each case the work schedule provides for a workweek of from 44 to 48 hours for women but from 52½ to 63 hours for men. One of these firms was planning at the time of visit eventually to place women on almost every type of work except where heavy lifting was required. This included the operation of a variety of machine tools. Furthermore, women were to be hired in this firm as replacements for men, and not to expand the labor force. In each of the five States where maximum hours are 48 or less, adult women, at least by special permit, may work at night, thus allowing several shifts.

Before women can be employed, toilet facilities must be provided for them. This can be a very real problem. In at least 5 of the 15 firms visited, plans to hire women were delayed or hindered because of difficulty in securing materials under priorities for the installation of the necessary equipment. One plant had to place a sizable proportion of its women machine-shop workers on the third shift because the office workers' facilities were the only ones women could use pending completion of the factory equipment. The crux of the situation, however, is not that materials cannot be secured at all, but that they are slow in being made available. Plans, therefore, for providing facilities for women must be made as long as possible before women are to be employed, so that the delays experienced will not handicap the organization unduly in its recruitment.

Though for various reasons, some of which have been discussed, certain firms have been more active than others in hiring women for factory work, most agree that the time has come when the woman labor supply must be tapped in earnest. Furthermore, several have expressed great satisfaction with the ability and efficiency of their women workers and their capacity to learn and to produce. These firms are planning to hire many more women. The question remains, then, how extensively can women be employed in the machine-tool industry when its basic production problems and processes are con-

sidered? The following pages will be devoted to a discussion of this general subject.

Department distribution of men and women in 13 machine-tool plants [1]

Department	All workers		Men—Number	Women		
	Number	Percent of total		Number	Percent of department total	Percent of women's total
Grand total	41,233	100.0	37,880	3,353	8.1	100.0
Total factory—productive	26,477	64.2	25,799	678	2.6	20.2
Foundry	1,880	4.6	1,880			
Raw steel; castings receiving and cleaning; painting	606	1.5	606			
Heat treating, blacksmith, forge, sheet metal and welding	718	1.7	706	12	1.7	.4
Inspection	1,777	4.3	1,614	163	9.2	4.9
Machining	13,132	31.8	12,876	256	1.9	7.6
Assembling	6,283	15.2	6,271	12	.2	.4
Supervisors, trainers, n. e. c.	116	.3	116			
Apprentices, n. e. c.	306	.7	275	[2] 31	10.1	.9
Miscellaneous, n. e. c. [3]	1,659	4.0	1,455	204	12.3	6.1
Total factory—nonproductive	8,327	20.2	8,187	140	1.7	4.2
Shop offices	1,124	2.7	1,068	56	5.0	1.7
Receiving, shipping, and finished stores	1,214	2.9	1,192	22	1.8	.7
Powerhouse and equipment and machine maintenance	975	2.4	975			
Service, laborers, truckers	1,845	4.5	1,826	19	1.0	.6
Tool crib (tool supply)	396	1.0	386	10	2.5	.3
Gage inspection, laboratory, metallurgy	18	[4]	17	1	[5]	[4]
Experimental, design, and pattern shop	402	1.0	400	2	.5	.1
Toolroom [6]	1,239	3.0	1,213	26	2.1	.8
Miscellaneous, n. e. c.	1,114	2.7	1,110	4	.4	.1
Total office [7]	6,429	15.6	3,894	2,535	39.4	75.6

[1] Covers all workers, whether engaged primarily in making machine tools, machine-tool accessories, or other products. All workers in 2 additional companies and 45 men in another could not be distributed by department because of lack of detailed data.
[2] In training in apprentice department but not apprentices.
[3] Includes all productive workers primarily on products other than machine tools and machine-tool accessories.
[4] Less than 0.05 percent.
[5] Not computed; base too small.
[6] Productive work may be done in the toolroom.
[7] Includes 58 men in sales force and machine installation and service.

CAPACITY OF THE INDUSTRY TO EMPLOY WOMEN

The machine tool is an intricate mechanism. The tool itself, the instrument that actually cuts into the metal, is one of the smaller parts of the machine, in fact, an accessory to it that may be easily and quickly replaced. There may be a ton or more of frame, ram, gears, racks, and other devices all coordinated to direct the small tool in its course through or against the metal to be worked. Machine tools may range in size from those small enough to mount on a bench and weighing only a hundred pounds to giants that stand as high as a three-story house and weigh several hundred tons.

The lathe was the first machine tool and retains its original principle of operation. It is a turning machine in which the tool remains stationary, the work revolving against it; in this way a cylindrical surface is generated. Drilling or horizontal boring machines and milling machines are the direct descendants of the lathe. The former

cut round holes by means of a rotating cutting tool; the latter primarily produce flat surfaces by means of a rotating tool with multiple cutting edges that take successive layers from the work. For other kinds of flat-surface work there is the shaper, in which the tool moves back and forth over the work, and the planer, in which the work reciprocates beneath the tool. There are many other devices for special purposes, such as slotting machines (really vertical shapers in which the ram carrying the tool moves vertically and thereby may machine flat surfaces at right angles to the main body of the work), broaching machines, gear cutters, thread cutters, automatic screw machines; for a final smooth finish, grinding, honing, and lapping machines.

Each machine may be built for either of two purposes: (1) to perform different operations on miscellaneous pieces or (2) to perform the same operation or operations on quantities of pieces of the same type. The first kind of machine is versatile, flexible, and adjustable. Ordinarily it is operated by a skilled machinist and with it can be constructed other machines, including those of the made-to-order variety. Machines of the second type are specialized. They often have a capacity for multiple tools—groups of drills or cutters working away simultaneously—and may be partly or fully automatic, so that once set up they require an operator only to load and unload and to start and stop them. It is such machines that more often than any others are "one of a kind" and reach gargantuan size. As masters of mass production they frequently present special problems brought to the attention of machine-tool builders' sales engineers who design them in conference with the customer.

Machine-tool factories make both kinds of mechanism, but in so doing use the former type of machine almost to the exclusion of the latter. This is because very seldom even in the present emergency are really large quantities of identical machine tools ordered at a time. There are few firms that specialize in only one kind of machine, the drill press for example, the grinder, the lathe, and so on, and even those that do are prepared to make a variety of sizes and types and frequently must turn out "tailor-made" models such as those already described to fill special orders. One well-known manufacturer, said to be engaged in the "mass production" of milling machines, in 1940 made over 140 varieties of the bed and knee type milling machine, all differing in principal characteristics. Even with the degree of efficiency in manufacture achieved by this plant, milling machines or their components do not leave the assembly line with anything like the speed of a standard make of automobile. The assembly of only one component of the machine, the knee, takes 8 hours.

A single machine tool may have several thousand parts. There are, for instance, over 3,000 parts in a turret lathe. Working three shifts, a turret-lathe manufacturer cannot build a lathe in less than 3 months. The building of some types of machine tools and the larger lathes requires a considerably longer time than that, sometimes 9 months or a year. Though the 1942 output of machine tools was about 308,000 units,[1] or nearly 4⅔ times the output of 1939, this scarcely constitutes mass production when compared with the manufacture

[1] Exclusive of low cost (under $350) units.

in 1939 of over 10,350,000 radio receiving sets, over 2,800,000 passenger cars, and nearly 1,800,000 electric refrigerators. It is clear that no degree of plant expansion, installation of new equipment, multiple-shift operation, subcontracting, or dilution of labor and breakdown of job operations can speed machine-tool building beyond a certain point.

This being the case, machine-tool manufacturers asserted, the lots of parts running through a machine at a given time tend to be smaller on the average in the machine-tool industry than in many others, especially industries engaged in mass production, and obviously this necessitates frequent set-up of the machine, usually done by the operator, and requires a degree of skill said to be unobtainable in inexperienced recruits. Company officials said also that many of the parts to be made must be machined to very close tolerances, some of them so accurately that a leeway of only a few ten-thousandths of an inch from the exact dimensions specified is permitted. Some commented that the parts that must be handled on any one machine may vary greatly in size and weight, thus requiring a muscularly strong person.

Objections to the hiring of women were raised with regard not only to machine operation but to other jobs also. For the most part they were based on the one hand on the extraordinary skill or technical knowledge required to do the work, and on the other on the degree of physical strength or endurance necessary. Experience of other industries has shown that neither of these factors, within limits, bars employment of women. It must be pointed out also that though the machine-tool industry is not in mass production it has been forced to make certain adjustments to its recent and rapid expansion that follow the pattern of mass-production techniques and thus allow at this time the extensive employment of semiskilled labor.

In recent years large numbers of inexperienced men have been trained in the industry within very short periods, and it has been estimated that most of the men making machine tools in January 1942 had never seen the inside of a machine-tool plant 2 years before that date. In many cases the regular 3- to 4-year apprenticeship course for training all-round machinists has been practically discontinued in favor of an 18-months learnership program or a few months or even weeks of instruction on one specific machine to be operated or job to be done. By 1941 the industry had trained thousands of new men, in from 6 weeks to 4 months, to operate even the more difficult machines such as boring mills and turret lathes. Training of this kind has been intensified and has already proved in many places the feasibility in the industry of breaking down an all-round machinist's skill into its component parts. In one plant this technique yielded enough skilled men to start a third shift, thereby doubling production within 3 months' time.

This happened in an important company of Cleveland, where a learnership program lasting 2 to 5 months for each student has been in operation since 1935. Only men with technical-high-school training or a knowledge of blueprint reading and simple measuring tools were accepted. Soon, however, not even the meager background required of these learners could be counted on, and the rank and file of absolutely untrained individuals were taken in a newly organized vestibule training school, designed to give in 6 weeks general background and specialized instruction on one machine or one job. After

6 weeks the pupils in the vestibule school enter the learner course to receive advanced training that will make them skilled machine operators. In most places there is no class instruction, but all trainees learn directly on the job under the tutelage of an experienced worker. They stand beside veteran employees, watching them closely. Soon they are allowed to operate the simpler controls and then the entire mechanism, thereby advancing to the status of semiskilled operators. Within 60 to 90 days learners can be put on their own.

Women as well as men have been successfully introduced into such short-term training programs and have proved to be apt pupils. The data show that when processes are broken down sufficiently to admit on-the-job training and dilution of skill, there is no doubt of women's capacity to participate in machine-tool manufacture. The fact that larger quantities of parts are now going through machine-tool plants makes subdivision of work more practicable than ever before and allows the use of set-up men in many places, leaving the more routine work of machine operation to others. With larger lots, runs tend to be longer, so some of the machine tools used can be set up for repetitive operations for which men or women are quickly trained.

In some plants good tooling has replaced individual skill. In one case the inside chasing of threads was eliminated by standardizing the thread and size of hole and then buying four or five expensive taps by which the job could be done with much less skilled attention; in addition, automatic sizing equipment was put on lathes in the machine shop so that some operations involving fine-finish turning can be given virtually unskilled employees to do. The same plant reduced the number of models made to the extent that some were being scheduled in lots of over a thousand. This enabled still further subdivision of operations and still more job simplification; it justified retooling many jobs with improved jigs and fixtures for quantity operation. It meant, in fact, that new workers coming in could be taught one operation and kept on that operation continuously. Though an official of this company has stated that work simplification is something that can be undertaken in almost any plant, regardless of size, this doubtless cannot be accomplished to the same degree in all places. It has not been carried out to any appreciable extent in most of the machine-tool plants visited.

Whether or not work simplification has been undertaken in an endeavor to dilute skills, it is well known that the machine tool itself as it is made today is a well-designed instrument presenting the maximum of aid to the operator. As one executive has said, "Owing to development and design, the machine tool now does the physical work which formerly was done by the operator. The machine tool has within itself the precision and the power needed to get the job done. All that the operator has to do is to have the intelligence and the dexterity to operate the machine. * * * It seems natural that girls should be able to learn this craftsmanship just as well and as rapidly as boys, and so make good machine operators." In another machine-tool plant the executives in remarking that modern machine tools are either fully or partly automatic, said, "After a little practice any dependable man with common sense and the ability to learn should be able to acquire skill." "Operating practices have been so standardized, in fact, that within a limited range the correct speed and feed for taking each cut is known. Enclosed and self-contained electrical

equipment is common and operated with push-button controls. Machines generally are equipped also with internal and self-lubrication.

Though inexperienced women can learn to do part, and in some places a considerable part, of the work in a machine-tool plant, a serious draw-back to their employment is the great size and weight of many of the pieces and the fact that large and small pieces may follow one another in the production process. This is not so serious, of course, where handling devices are provided. Further, men are no more capable than women of handling many of the major parts without the use of cranes, chain hoists, or other mechanical lifting devices and these very generally are part of the regular equipment in large modern machine shops. Women have been seen using lifting devices in connection with machining operations and operating both their hoists and their machines with no apparent difficulty. As a matter of fact, it appears that women can be employed more successfully on very heavy work when power chucks, lifting mechanisms, and other aids are provided than on parts that are beyond the lifting ability of the average woman but not that of the average man.

There are many instances in which the work, even with the use of handling devices, requires more strength and endurance than the average woman commands. In assembly operations, where this is very often the case, two of the firms visited had segregated the lighter from the heavier work and were employing a good many women on unit-assembly operations, and another was actively making plans for such a scheme. Rearrangement of work so that the lighter parts in machining departments can be handled separately from the larger and heavier ones appears possible also in sections where a number of machines of the same type are used. In fact, one official who was consulted about this said it could be done in his plant and probably would be done if women were hired. The rearrangement, however, would require reorganization of the prevailing scheme of manufacture, since all the pieces for one assembly are kept together and machined on the same machine. In his opinion the break-down of operations so that all the small parts for different assemblies could be handled on certain machines would decrease the efficiency of plant operation, in that more movemen and stock chasers would be necessary. In other plants the flow of production, not being arranged exactly in this fashion, allows more conveniently for the suggested division of work. In one of the firms visited the smaller tools in two machining departments were already separated from the medium and large, the lighter work being at one end of the room and the heavier at the other. The smaller parts were being routed separately in these two departments, yet no women were employed there nor was their employment anticipated, though the company had already begun to hire women operatives in other parts of the plant.

The weight of the work has nothing to do with the precision required of the worker. It should not be underemphasized here that in machine-tool manufacture a great many operations that command special skill and accuracy remain even where process simplification and dilution have been accomplished. Inexperienced men and women cannot be expected at the beginning to perform such operations, many of which need seasoned judgment as well as the skill that comes from aptitude tempered with experience. Yet, though they have been in

the industry a relatively short time, women already are doing accurate work on jobs requiring, for example, machining to a tolerance of .0002", or a fifteenth part of the diameter of a hair. It was said more than once that women had been found unusually conscientious about following instructions exactly. Further, where small lots are common some women already are learning the setting up of their own machines, generally considered skilled work. This was true in six of the eight plants visited in which women were on productive work. One of these, in fact, has no special set-up men, since women are expected to set up all the machines they operate.

Great Britain has been at war nearly 4 years and consequently is now suffering a much greater scarcity of manpower than is the United States. This is reflected in her machine-tool industry, in which the proportion of women to men very materially exceeds this country's and the jobs women are doing are much broader in scope. To be sure, most persons in the industry here would agree that in case of real need women could and would be employed in occupations no one now even dreams of suggesting. In this report the types of work proposed as feasible for women are those in which women can be employed conveniently and easily now. Consideration is given to the jobs women are already doing in the industry here and in Great Britain, to the work suggested by plant officials as suitable for women, and to their jobs and the types of machine tools women are operating in other industries.

OCCUPATIONS: CURRENT EMPLOYMENT OF WOMEN AND FUTURE POSSIBILITIES

Methods of production and systems of departmental organization differ in details within the industry, but in general the types of work are very similar throughout. Therefore the departments and occupations within each as they might be found in a "typical" plant make the framework of this discussion. It is recognized that no one company may have all the divisions outlined.

Work with raw stock: Foundry work, castings cleaning, forging, bar-stock storing and cut-off.

The kinds of raw iron and steel stock used in making machine tools are chiefly castings, forgings, and steel bars. The major components for the machines, such as beds, headstocks, and tailstocks, are made from castings prepared usually in outside foundries. Two of the firms visited, however, had foundries as integral parts of their operations. No women were employed in them, though women have been engaged in foundry work as core makers for many years. Cores weighing up to hundreds of pounds may be made by women if mechanical aids are provided, though in this country women are for the most part still making only the lighter cores.

The castings must be cleaned before they begin their trip through the machining departments. Some work of this kind was being done in each of the plants visited, though in a few cases most of it was completed in outside foundries before castings were delivered. The work generally requires a considerable amount of physical strength, since it involves the use of heavy hammers and chisels and portable

grinders and polishing equipment. Sandblasting equipment also may be used. No women were employed in the castings-cleaning departments, sometimes called snagging and chipping departments, nor were they being considered in future hiring plans. Though women are doing this work in Great Britain, it does not appear to be suitable for women here as it is now arranged. Further, since the total number of workers involved is relatively small, this is one of the last places women's employment might be recommended.

Forgings are used for parts that require great strength, such as shafts, levers, and gears. Some of the plants had small forge departments, but, as in the case of castings, at the time of visit most were buying their forgings. In any case, not only were few workers employed in machine-tool forging, but it did not appear likely that any significant number of women could be successfully inducted to the work.

Small parts such as spindles and small gears usually are made from steel bar stock. Bars of various lengths and diameters are stored in steel-stock rooms and, as needed, pieces are cut off with such equipment as power hacksaws, cold saws, and abrasive cut-off machines. No women were employed in this work. It is not highly skilled but involves the handling of heavy bars as they are received, storing them in some orderly system of arrangement, and, in addition, loading, unloading, and operating the cut-off equipment. Women could do some of the work on small light bar stock and even on the heavier stock if handling devices were provided. As the work was organized at the time of visit in the plants surveyed, however, most of it would be too heavy for women.

There are several departments in machine-tool production besides those just mentioned and the three major ones to be considered later i. e., machining, assembly, and inspection. They come in at different stages in the manufacturing process but will be discussed here without regard to logical order.

Painting.

Spray painting is the more common technique used in painting castings and finishing the completed machines, though some hand painting also was seen. All the work was done by men, though women could be employed to do some of it where the proper exhausts were provided for protection from paint and fumes. To be sure, the total number of men that could be released would be relatively small.

Sheet-metal work.

Sheet-metal departments were noted in some plants where guards and enclosures to cover moving parts and to keep dust and dirt from machinery were being made. Power shears, nibblers, bending machines, and the like were being used. Most of the work appeared to be too heavy for women, since the pieces of metal to be handled were large and of heavy gage. No women were employed, but women could handle small power presses and power shafts on the lighter types of work.

Welding.

Small groups of male welders were occasionally noted doing oxy-acetylene or electric arc welding work that women were known to be doing successfully in other industries.

Heat treating.

Heat treating is an essential process in machine-tool manufacture and was part of the plant operations in every firm visited. Various methods of heat treating, including hardening and annealing and tempering, carburizing, and case hardening, are used on different parts for different purposes. Heat treatment may be employed to relieve stresses and strains in forgings, to harden gears so they will stand up under strain and wear, and to produce wear-resistant surfaces on cutting tools. In all but one of the plants visited heat-treating work, whether on parts for machine tools or on cutters and other machine-tool accessories, was being done in one department. One plant had a separate heat-treating unit for its small tools.

Opportunities for women in heat-treating departments as they are now managed are limited; very few women were employed in them at time of survey and those employed were not engaged in actual heat-treat work, but in hardness testing. First, much of the work requires considerable background and experience and consequently cannot be handled by inexperienced recruits. Second, in some plants a great deal of heavy work is involved in the loading and unloading of furnaces and in plunging the heated pieces of metal into quenching tanks. And finally, some employers considered the work connected with heat treating unsuitable for women because the working conditions involve exposure to intense heat, possible burns, and chemical fumes. Adequate protection is of course required for both sexes under such conditions. An increase in the amount of handling equipment and the installation of automatic feeds for furnaces would make possible the introduction of women to the work in many places. In fact, at least one official stated that women could be employed immediately to work on the simpler heat-treating operations on small pieces of metal.

Rockwell and Brinell hardness testing is commonly done in heat-treating departments. One of the plants visited employed a few women for this work in which the use of gages also was involved. Women can do this type of inspection in other machine-tool plants also when, with or without mechanical handling devices, it is within their handling capacity.[2]

In one plant it was said that women might be employed on the straightening of light tools of the bar type. This involves placing under presses tools that are hot after passing through a heat-treating process. Women are heating and straightening small drills in the machine-tool-accessory industry, and consequently could do similar work on somewhat larger types of tools. One firm has solved the problem of the danger from hot metal pieces breaking on the application of pressure by providing a metal guard with a safety-glass window through which the operator watches her work.

MACHINING

Only 12 percent of all productive workers and less than 2 percent of the women on production in the machine-tool plants visited[3] were in the departments just discussed. Machining, on the other hand,

[2] See p. 40 for a discussion of weight lifting.
[3] Proportions based on data available in 13 of the 15 plants.

employs more personnel than any other division of work, using half of all the men and nearly two-fifths of all the women in production departments. Most of the employees in machining units are operating machine tools, though workers who burr and file, and foremen, supervisors, and general laborers, also are included in the totals.

Two plans of organization were encountered:

(1) Most common was the departmental system, in which machine tools of one kind, such as milling machines, turret lathes, or drills, were grouped together and parts were routed accordingly. Under this system, within each separate machine-tool department is one kind of machine in various sizes and makes, sometimes with a few machine tools for supplementary operations that differ from the predominating type.

The way in which such an arrangement operates may be illustrated by a description of the departments through which several components of a lathe pass in a firm making engine lathes and organized along these lines. The lathe-bed castings, after being cleaned and painted, are sent to the planers. Immediately following planing, they are subjected to heat treating and then move to a group of large bed-grinders. Finish planing comes next and then the drilling operation, which allows attachment of the legs of the machine to the bed. The bed moves on finally to the assembly department, where it meets other completed parts. Headstocks go through milling first, then drilling and boring-mill operations, after preliminary cleaning and painting as rough castings. From the boring mills they proceed to assembly. Tailstocks follow the same sequence, from painting to milling machine and drill departments, but from this point they are directed to machines where top and bottom sections are scraped to give a tight fit. A tailstock boring mill here takes care of the last machining operation prior to sending on the finished tailstocks to storage. Forgings to be made into gears are machined first on turret lathes, then gear cutters and drills (when gears are to have oil holes). They pass next through heat treating, and then go to internal grinders, a bushing operation, internal grinders again, gear-tooth grinders, and finally stock storage.

(2) In contrast with this routing of parts to the various operations, some of the plants visited were organized on a unit system of operation in which wherever possible all the machining equipment necessary for the manufacture of a unit of a machine is grouped in one department. Some drilling, grinding, milling departments may be maintained for the manufacture of small pieces, but the major components, such as spindles, gears, shafts, columns, knees, and saddles, for the most part are made complete each in its separate place.

In one milling-machine factory the knee department covered more than 40 separate operations on the knee casting, which arrived there directly from the cleaning and priming department. Included in the knee department were two types of planers, three types of milling machines, radial drills, and three types of boring bars. Another component, the column, underwent 37 separate operations, 24 of which were performed directly in the column department by the use of 7 different types of machine tools. These included medium and large planers, boring bars, Kearney & Tracker special duplex and multiple bars, horizontal knee-type milling machines, and radial drills.

For purposes of this report it seems best to discuss the machines women operate or can operate without regard to a particular system of plant organization. For this reason each major variety of machine tool is considered separately and without reference to plant process except as this affects the employment of women.

Lathe operation.

Lathes (including screw machines), drilling, grinding, and milling machines, in that order, were the tools used in largest numbers in the plants visited.

Engine lathes.—Lathes are the most versatile of all machine tools. This explains why so many more of them are made and used. In addition to ordinary turning operations, they can drill, bore, ream, and tap straight or tapered holes, file, polish, lap, or wind springs and electrical coils. With the use of adapters and attachments they can perform milling and grinding operations also. The ordinary engine lathe is made in a number of modified forms, such as turret lathes, automatic lathes, and single-spindle automatic screw machines. The two last mentioned are used extensively for the rapid production of duplicate parts.

For years women have been operating engine lathes in many industries. Less than half the machine-tool plants surveyed, however, were employing women on engine lathes at time of visit, and some of these employed women on lathes only in the fabrication of products other than the machine tool. Where women were operating engine lathes in the production of machine tools they were on such models as the LeBlond Regal and the Monarch model W. Some had been employed only 2 or 3 weeks at time of visit, yet they were learning to read blueprints and to do simple set-ups. Lots ranged from 100 to 1,000 pieces and required the greater part of a day for completion. Women on the Monarch model W lathes were performing turning operations on small rods and gear blanks. One woman was using a Monarch to cut lead screw threads.

Most of the women operating lathes in accessories or other departments were using only small bench lathes. Several women in one company, however, were operating specially constructed South Bend engine lathes of fairly large size with which they were cutting the teeth on broaches. They were required to read blueprints and mark out their own work. Each type of cutter on which the women were engaged had a different pitch of teeth, so they had to be able to mark out numerous kinds of work.

Though the employment of women on engine lathes was not general, in practically every firm visited the men interviewed agreed that there were lathe operations in their plant to which women could be successfully introduced. One company, not then employing women for lathe work on machine tools, had employed a number during the First World War, many of whom learned to do their own setting up. Officials in another company, where women were soon to be placed on production for the first time, were planning to introduce them from the beginning to the small engine lathes, such as the Hendey 4Cx54 inches and Hendey Head lathe. The women will work on small parts, and though men will do the set-up in the beginning, the plan is gradually to teach the women to take this over. Various ad-

ditional types of lathe suitable for operation by women were seen in the plants visited. These include among others,

Pratt & Whitney engine lathes 16 x 60 inches and 16 x 54 inches.
American engine lathe 16 x 60 inches.
American Pacemaker lathe.
Sidney engine lathe with 18-inch swing.
Reed-Prentice engine lathes (in small sizes).

Turret lathes.—Much of the work done on turret lathes in the plants surveyed is heavy, so opportunities for women operators on these machines appear to be limited. At time of visit only one woman in all 15 plants was actually operating a turret lathe. This machine was a Jones & Lamson of small size.

Four other firms, however, had made plans to employ women on turret-lathe work. In one of these women would be expected to operate the smaller Jones & Lamson machine and the Potter & Johnston chucking lathe, and automatic chucking machines. Another company was planning to have women operate Warner & Swasey ram-type machines. Two others expected to hire women to work on some of the Warner & Swasey saddle-type models, after introduction of air chucks or handling equipment.

Where the work is heavy and handling equipment is not available, rearrangement of the parts to be machined is often possible, the lighter being routed to machines to be manned by women. Such a plan was thought feasible in two plants in which several of the smaller Gisholt, Jones & Lamson, and Warner & Swasey turret lathes were seen. Special set-up men would have to be employed at first, however, since runs are short.

A number of the men interviewed agreed generally that the ram type of machine is suitable for women machine operators. This kind of turret lathe is designed for smaller work and has a shorter stroke than the larger saddle type of machine. It is easier to operate also, since the turret is more easily moved on the ram than on the saddle. But though the saddle type of machine is larger and somewhat more difficult to operate, women could do the work on some of the models with the use of power chucks to avoid the necessity for exerting great physical strength in tightening the pieces, and with the aid of hoists and handling equipment to move and lift the parts to be machined.

In Great Britain women are successfully operating turret lathes adapted for chucking and bar operations even when processes are varied and runs are short. It is significant further that women operated turret lathes in World War I in at least two of the firms visited, yet no women were employed on such machines by these companies at the time of the 1942 survey.

Hand screw machines and automatics.—No women were employed on screw machines in the machine-tool plants visited, though hand screw machines, closely related to turret lathes, and small automatic screw machines have been operated by women in other industries for some time, particularly on quantity production of identical screws or other small parts.

The setting up of automatic machines is really the most difficult part of their operation. After the set-up has been made, such machines are, as the name implies, largely automatic. Inexperienced workers are less easily broken in on machines of this type unless the runs are long enough to make it feasible to employ a set-up man who

can be assigned to the care of several machines, the operator being left only with the job of loading, unloading, and watching the machine. Many of the automatics seen in the plants visited, moreover, were very large, and the bar stock used was large and heavy. These considerations, and the fact that in machine-tool work the set-up is often quite complicated, preclude the employment of women on the larger machines and of inexperienced women on some of the smaller ones.

Nevertheless, several of the plants visited had small machines of the hand and automatic types which women could operate under the conditions then observed, and in two the employment of women was contemplated. In one of the latter, women were to be hired to operate a small hand screw machine used for turning, forming, centering, drilling, reaming, and tapping. In the other, women will be employed on small automatics. A production supervisor in a plant not planning to employ women on screw machines made the statement that women could be trained to do their own set-up on small automatics and that the hiring of women on such machines was limited largely by the size of the bar stock that must be handled.

Milling operations.

Milling, the machining of metal by bringing it into contact with a multiple-edged rotating cutter, includes the hobbing, cutting, and finishing of gears and the milling of threads. Under this definition are included both general-purpose milling machines on which various kinds of work can be done and those restricted to the performance of specific operations, such as gear cutting. Machines used in thread milling or in keyway, cam, or clutch milling were seen frequently in milling or gear-cutting departments.

Milling machines vary considerably in size as well as type. There are small hand millers, different sizes of automatic machines, horizontal and vertical machines and, finally, huge planer-type milling machines used for work on very large parts. In the plants visited, the planer-type machines usually were grouped with such machines as ordinary planers, great boring mills, vertical turret lathes, and radial drills, employed on the heaviest types of work.

It is agreed generally that women can operate easily hand milling machines and the small- and medium-size power mills. A recent survey by the Women's Bureau [4] of the employment of women in the manufacture of small arms found more women working on milling machines than on any other one type of machine. In Canadian small-arms firms visited in an earlier survey as many as 60 percent of the milling-machine operators were women and this proportion was to be increased. The United States small-arms plant surveyed that employed the largest proportion of women in factory work had no men on hand mills, small milling machines, and medium-size mills, except in the case of a very few operations on large parts too heavy for women to handle. The manufacture of arms, however, is a mass-production industry.

Few women were operating milling machines in the 15 machine-tool plants surveyed. Some were on such machines in each of 6 plants, and in at least 2 of these plants the proportion was expected to

[4] Women's Bureau Bul. 192–3, Employment of Women in the Manufacture of Cannon and Small Arms in 1942. 1943.

increase. In some cases many of the machines used and the operations performed were suitable for women but the employment of women was not then anticipated.

For example, the cutter-manufacturing department of one plant had men on Brown & Sharpe machines of the Nos. 2 and .000 types that women are known to be operating successfully elsewhere. The work to be done was not too heavy nor too highly skilled. In another plant the smaller steel parts and castings were being milled by men on, among others, Brown & Sharpe Nos. 1 and 2 machines and a United States hand miller, all operated easily by women. The men on these machines do their own set-up. About 75 percent of the work in this all-male department probably could be done by women if they were taught the set-up work. An earlier study made by the Women's Bureau shows that Canadian women milling antiaircraft-gun parts set up their own machines.

In another machine-tool plant visited in the 1942 survey, a proportion of the work in the milling of collets could be done by women. Some operators on milling machines were young boys who had had but 1 year of experience. Still another company had employed women to operate milling machines in the earlier war. At time of survey many of the machines in its milling department were of medium size and it was said that women would be hired again if the labor situation warranted.

These are but examples chosen at random. They show that many more women could operate milling machines in the machine-tool industry. Some plants without women on such machines at time of survey had made plans to hire them. One already using some women on milling machines expected to employ women for Jones & Lamson cam milling machines and small Nichols & Kempsmith hand mills. The work would involve die manufacturing rather than milling on machine-tool parts. Another company, one that had made a job analysis, planned to employ women to do face, slab, straddle, slot, and keyway milling on both vertical and horizontal milling machines.

In a number of plants much of the work to be done on milling machines was heavy, involving the handling of heavy castings and parts. A good deal of the work was beyond the strength of men also, and chain hoists were being used. Women would be handicapped further where considerable force is necessary in the use of wrenches, mallets, and other tools for tightening and releasing work on the machines. It is very important that work be secured so that it will not be sprung in clamping and will be correctly alined. Some persons interviewed suggested, nevertheless, that women might operate rather large milling machines (of the No. 4 size Cincinnati type, for example) if good handling equipment were provided and if power chucks were placed on the machines, thus making it easy for women to load and unload the work.

This has not been suggested in the case of the huge planer type of milling machine. It is interesting, however, that the March 1942 issue of the *Engineering Bulletin* published by the British Ministry of Labor and National Service pictures a British woman working on a multiple-type planer-miller with which she is milling the bed of a thread-milling machine. Doubtless this woman had mechanical and other assistance in placing this large casting on the machine, but the

picture indicates that it is not impossible to employ women on milling work even of this very heavy type.

Among women milling-machine operators in the machine-tool plants visited were some on Kent-Owens and Nichols hand mills. They had been on this work only 2 weeks at time of survey, yet they were already setting up some jobs. The number of pieces per lot varied a great deal. Some might be large enough to allow the same set-up to be kept for as long as 2 days, but other numbers were small. The women's supervisor said he was well satisfied with their work. They were employed to perform milling operations on a great variety of bolts, nuts, rods, and other small parts. One of the women had worked on five different jobs, ranging from 1 to 1,000 pieces per lot, on the day before the field agent's visit. This woman had received 158 hours of training in a defense course prior to employment.

Other women were milling gears and shafts. The employment of women on milling machines in the department where they were working was limited only by the weight of the gears and shafts women could handle. The gears weighed from 1 to 110 pounds and some of the shafts weighed 60 to 70 pounds as forgings.

A few women here and there were seen operating some of the more specialized types of milling machines. A woman was doing keyway milling on a Taylor & Fenn spline-milling machine in one plant, and in two others women were operating Lees-Bradner and Pratt & Whitney thread-milling machines. Foremen and production men in several other places agreed that women could be employed in their plants on work of this kind.

Among still other milling machines women were operating in the plants visited were—

Cincinnati milling machine Nos. 0–8, 1–12, 2.
Milwaukee milling machine Model H.
Brown & Sharpe milling machine Nos. .0, .000, 2.

Gear cutting.

Frequently there is a special department for gear-cutting operations in machine-tool plants. Gear shapers and gear hobbers were the machines most commonly seen in such departments, though gear grinders, gear finishers, and some miscellaneous machines of other kinds often were segregated there also.

Though only two plants were employing women to operate gear cutters at the time of visit, several others were expecting to put women on this kind of work. In fact, one company was considering filling most of the jobs in the gear-cutting department with women. Set-up men would be employed, but each woman would be expected to tend a number of machines. The machines it was planned they would operate included gear cutters or shapers made by Brown & Sharpe, Fellows, Barber-Colman, Cincinnati Milling, and Newark. According to the analysis of a supervisor in another plant, if women were employed they could operate, among several others, the Fellows gear shaper No. 7 and the Gleason bevel gear rougher No. 12. In still another place the Barber-Colman Model S bench-type hobbing machine was soon to be operated by women. The women would not do the set-up work. There were several other companies with gear-cutting work on which women could be employed; ordinarily, however, set-up men would be considered necessary.

It is interesting in this connection that in one of the two plants visited where women were employed on gear cutters, each woman, in addition to operating two to five machines, did her own set-up work. This firm planned to hire more women for gear cutting. Those employed at the time were operating Fellows gear shapers of the 6A type and, in addition, several gear shavers of sizes 12 to 18 inches.

Gear-cutting work was limited, of course, in firms where the machines manufactured were hydraulic rather than mechanical in operation. In fact, hydraulic machines have fewer small parts than others have, thereby placing certain general limitations on the employment of women.

Grinding.

Much shaping of metal parts is done by bringing them in contact with rotating abrasive wheels mounted on various types of grinding machines. There are several grinding techniques. Grinding a hole involves internal grinding; shaping the outside of a rotating piece, external cylindrical grinding; and finishing a flat surface, surface grinding. The grinding process also includes polishing, buffing, and lapping operations that are performed by means of specially dressed rotating wheels.

Numerous types and sizes of internal, external cylindrical, and surface grinders were being used in the machine-tool plants visited. In addition, there were many specialized types of grinding machines such as disk grinders, thread grinders, and gear grinders, as well as a variety of tool and cutter grinders and sharpening machines for grinding and sharpening drills, milling cutters, reamers, and other tools.

Rough-grinding operations may be done on certain machine-tool parts during the early or intermediate stages of manufacture, but a great deal of grinding is done as a finishing operation. Finishing is precision work that must be done to very close tolerances. Ineptness in such work may cause great waste of material, time, and effort. Nevertheless, in the plants visited women were employed to a greater extent in grinding operations than in any other kind of machining. In addition to various lapping and polishing devices, some typical grinding machines women were using include:

Arter rotary surface grinder.
Brown & Sharpe external grinder No. 5.
Brown & Sharpe surface grinder No. 2.
Cincinnati cutter and tool grinder No. 2.
Ex-Cell-O thread grinder.
Heald rotary surface grinder No. 22.
Norton cylindrical grinders 10 x 36 inches and 10 x 48 inches.
Norton surface grinder 10 x 60 inches.

In one plant more than 30 women were grinding involute cutters and gears. They operated two machines each on both dry and wet grinding, performed their own set-ups, and dressed their wheels. The work done by women on the day shift was performed by men at night. It had taken the women about 2 months on the job to learn the set-up work. The same firm employed a woman to grind tapers on shanks with a Brown & Sharpe No. 5 external grinder. She was doing her own set-up and was allowed practically no tolerance, according to the plant official interviewed. In another plant several women who were form grinding also set up their own

work. Each new set-up had at least to be checked for every tool ground and the tolerance allowed was but .0002 inch. Women doing wet grinding on machine-tool parts by means of small Arter rotary surface grinders were performing their own set-up work also. In another company women on Norton 10 x 60-inch surface grinders were at first allowed a tolerance of .0005 inch, but later were upgraded to more difficult work on which they were permitted only .0002 inch leeway. One of them, employed only 10 weeks at time of survey, was already performing a complicated set-up involving compound angles and requiring the use of sine bars and Jo blocks.

Other women were doing various types of internal, face, and form grinding on small cylindrical, internal, or surface grinders and on tool-sharpening machines, while a few were performing lapping, polishing, and buffing operations.

In addition to the work they were already doing and the jobs soon to be opened to them women could take over a great many more of the grinding operations performed in the machine-tool plants visited. There was much tool- and cutter-grinding and grinding on small parts to be done with the use of such machines as small Rivett internal grinders, Landis external grinders, Brown & Sharpe external grinders, small Thompson and Heald machines, and the like, work of the sort that women were doing already in some of the plants. One firm was employing men on a Brown & Sharpe No. 5 plain grinder, a machine specially built for women to operate while seated. Additional opportunities for the employment of women on the lighter work appeared so numerous, in fact, that it hardly seems worth while to note also that some heavier kinds of jobs being done in the plants surveyed are not beyond women's capacity to perform. For example, in one firm where many small parts were ground at once on large Blanchard grinders, the work can be done by women. In another, large surface, external, and internal grinders could be operated by women with the installation of certain handling equipment. Some types of precision work, however, would have to wait till women had experience and were ready for upgrading. It is of interest in this connection that women are already doing such heavy and skilled work as surface grinding on turret-lathe saddles in Great Britain. One woman on such a job is pictured in a recent issue of the *Engineering Bulletin*. Her work requires absolute parallelism, the limit of error being .0005 inch. The application of cut must be delicate so that distortion due to increased temperature is avoided.

Grinding is an extremely hazardous occupation unless precautions are taken to protect the operator from the dust that is generated or from other flying particles. The hoods now generally provided, especially on the newer machines, help to prevent injury from pieces flying out or from possible breakage of the wheel. Danger from the metallic dust is prevented by wet grinding, in which the cutting takes place under a stream of water or oil. Some but not all of the grinding in machine-tool plants is done by the wet process. Where there is dry grinding, adequate exhaust systems should be provided. Satisfactory standards for such systems have been set up in various State codes. Those of Ohio and Illinois affect a considerable proportion of the machine-tool firms.[5]

[5] *See also American* Engineering Standards, *Safety Code for the Use, Care and Protection of Abrasive Wheels.* Approved by the American Standards Association. New York, 1935, 36 pp.

Until recently the employment of women on dry grinding has been prohibited in Ohio except for occasional tool grinding. Since the law forbids the hiring of women to operate, specifically, emery and corundum wheels and belts coated with emery or corundum, it has been ruled, in the interest of the war effort, that women may now be employed on aloxite, carborundum, alundum, or any type of wheel other than emery or corundum. This modified interpretation of the law, however, does not permit hiring women to do snagging or heavy grinding, or grinding operations requiring constant standing. The operation of buffing or polishing wheels is still forbidden. Actually, investigation by the Women's Bureau of occupations suitable for women in war production reveals that in plants with good dust-collection methods and other adequate protection the occupations of grinding, polishing, and buffing are among the most desirable jobs for women.[6]

Drilling.

Drilling and other types of boring operations such as reaming, tapping, countersinking, and counterboring on single- and multiple-spindle drill presses are occupations women commonly have held in industry.

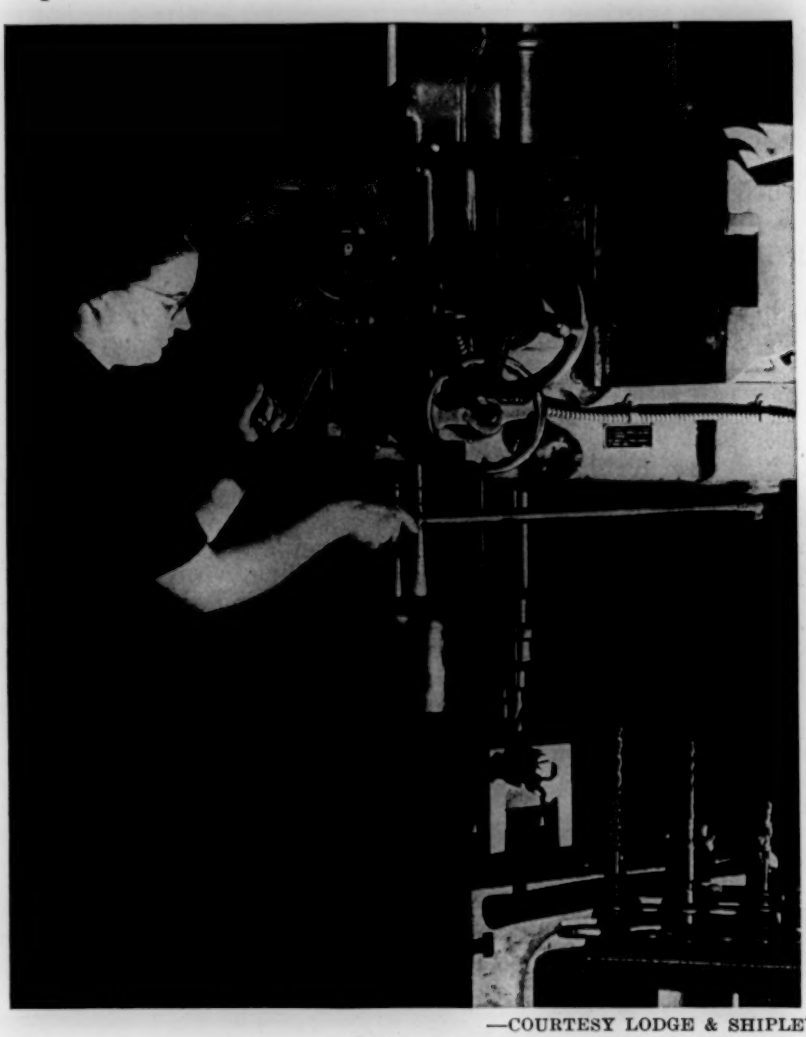
Though many of the drills in machine-tool plants are large machines principally of the radial type, there are numerous drills of other kinds that women could operate before it would be necessary to hire them for the larger radial drills. Some women were operating single- and multiple-spindle drill presses in six of the eight plants where women were on productive work. More women could have been employed on drill presses in these plants. Four companies with no women on drilling operations were planning to hire them. In one of these women were to operate multiple-spindle drills and would be trained gradually to set up the machines and sharpen the cutting tools. In another, they were to be hired for drilling operations, including jig drilling and counterboring on an upright Prentice drill and for light work on sensitive drill presses at which they might be seated. On the machines last named women were to perform jig drilling or their work would be laid out for them. The same company was planning to employ some women for lay-out work also. This work involves a knowledge of mathematics, the reading of blueprints, and the use of scribers, dividers, squares, surface gages, and the like.

In addition, examples were noted of drill work altogether suitable for women in plants where women were not then employed in such work or no plans had been made for the introduction of women. One firm had a department in which small and large parts were being routed separately to drill presses allocated by size on the factory floor. There were small and medium-size drills in this department that women could have operated easily. Another firm had a division set aside for work on the smaller parts and castings in which drill presses that women could operate were located. All the machine workers in the department did their own set-up, work for which women could be trained. Still another plant had multiple-

[6] Women's Bureau Special Bul. 7, Hazards to Women Employed in War Plants on Abrasive-Wheel Jobs. 1942.

spindle drills on which a considerable amount of small work was being done, such as the drilling and counterboring of taper screws. Much of the work was jig drilling and some of the lots consisted of several hundred pieces.

It is evident that the employment of women in machine-tool plants to operate sensitive drills and other small and medium types of



—COURTESY LODGE & SHIPLEY

WOMAN OPERATING SMALLER TYPE OF RADIAL DRILL. WORK FOR WHICH VERY FEW WOMEN HAVE BEEN EMPLOYED IN AMERICAN MACHINE-TOOL INDUSTRY.

single- and multiple-spindle table drills could be considerably extended, though these types of machines are not so numerous in the industry as the heavier models. Women could be hired later to operate radial and heavy single- and multiple-spindle drills on larger parts with the aid of handling equipment. Officials in two plants

agreed at time of visit that women could operate the smaller radials with 3- to 4-foot beam. British women already are operating the heavy radial drills.

Planing.

Planers are used widely in the machine-tool industry for heavy work on major castings such as the beds of machines. Sometimes many castings of smaller size are set up on large planers to be machined all at the same time, a process known as gang planing. To do such work, many of the planers are very large. One planer was seen that had a work capacity of 84 x 84 inches x 40 feet. Castings to be placed on such a machine may weigh thousands of pounds.

Because of the size of the planers and the parts to be machined on them, most of the firms visited were giving no consideration to the employment of women on planer work. Yet the director of the NYA machine-shop training school in Cincinnati was already, at the time of visit to machine-tool firms in the vicinity, training women to operate planers after boys had done the heavy lifting and set-up. In addition, an official of one of the plants surveyed stated that since one man cannot load the planers alone, two men and one woman could conveniently be employed as a team. His company already was having to train boys, so the fact that women were inexperienced would make no difference. One objection that has been raised to the employment of women on planers is that it requires skill to see that the bed of the machine is not twisted. The same company official was convinced that this is a matter not so much of skill as of supervision.

The superintendent of another plant said that some planing jobs in his company last one or two full days. He saw no reason why women could not tend the planers after men had set up the work. The women's part of the job would include also the use of calipers, verniers, scales, and the like for taking measurements, and enough knowledge of the work to be able to detect when the tool had become dull. The planers in the perishable-tools division of one of the machine-tool plants visited were only of moderate size. Here too the plant superintendent thought that women could be employed with the aid of set-up men to do the heavy work of getting the pieces into a level position and properly set into the machine. Even with the aid of handling equipment, this may involve much manual labor and the use of heavy wrenches and hand tools.

Women are already operating and setting up the smaller planers in British machine-tool plants, and in one of the factories visited in this country by Women's Bureau agents a woman had been employed as a planer operator in the First World War.

Miscellaneous work in machining departments.

Shaping is like planing except that in the former the tool moves over a stationary piece of work and in the latter the work moves back and forth beneath the tool. Shapers are generally much smaller than planers, being made more for small and medium-size work. Shaping machines on which the cutting tool moves vertically rather than horizontally are known as slotters. Shaping can generally be done by women, but except in two cases the few shapers and slotters in the machine-tool plants visited were operated by men. The women

employed were operating and setting up small Hendey shapers in a machine-tool-accessory department. At time of visit one of the firms with no women productive workers was considering the employment of women on both small and large slotters or vertical shapers.

The boring mills seen in the plants surveyed were heavy-duty machines usually placed in the same department as the planers or other large machines on which various operations on major castings or heavy forgings were being performed. The work to be done on these machines generally was considered too heavy and highly skilled for women. It should be mentioned, however, that women are operating horizontal boring mills in the British iron and steel industry. There are, of course, very many opportunities for women on lighter work for which they are not currently or generally employed in the machine-tool industry in the United States. These should be explored first.

Simple operations involving burnishing and polishing, burring, and filing are among such opportunities. Though a few of the firms visited had women on these types of work, several were employing men. Some of the men, to be sure, were older workers who were no longer able to do the heavier tasks. This shows good use of the available manpower. But many were able-bodied men and boys.

TOOLROOMS

A variety of work may be done in toolrooms, including tool repair on plant equipment, experimental work, and the manufacture of jigs, fixtures, and other tools for machines used in the plant and for machines sold to customers. Usually there are machines of all kinds because of the diversity of the work.

Many of the toolroom employees are highly skilled men, able to operate more than one machine on jobs requiring the closest of tolerance and most intricate of set-up. For this reason a number of the machine-tool plants visited reported that women could not be employed. Not all the work in toolrooms, however, requires considerable skill. In one of the machine-tool plants visited two women were operating small lathes. One of them sometimes laid out locators for holes to be drilled. The company was planning to employ more women in the toolroom, some to be taken from a group then in a training course consisting of special instruction on one type of machine. The all-round toolroom work requiring the use of a variety of machines would continue to be done by men. In another plant one woman assisted a man in checking lead screws on a Carl Zeiss machine. Another in the same firm assisted in making sketches of tools that required repairing. Other women in this toolroom operated single machines including cylindrical grinders, tool and cutter grinders, a heavy-duty miller, and engine lathes. The men operated all types of machines, some of them the same as those operated by the women. In a third plant four women were working to very close tolerances on single machines; they performed their own set-up. Two were on Landis Universal cylindrical grinders, type C, one on a Brown & Sharpe surface grinder No. 2, and one on an Abrasive wet-surface grinder No. 3B.

In the three companies in which these cases were cited it has evidently been possible to organize toolroom work so that some employees need operate only one machine. Where such an arrangement can be made, the employment of relatively inexperienced workers, men or women, is possible. As a matter of fact, a fourth company was planning at the time of visit to employ a considerable number of women in the toolroom as a result of an occupational analysis of the work and plans for dilution consisting in large part of providing set-up men. Some of the women to be hired would rough-grind on flat-form and cut-off tools and spacers with a surface grinder having a magnetic chuck. Some would use a surface grinder on tool posts, wedges, and ratchets. Others would mill knurls, form tools, dovetail tools, and the like. These are but a few of the toolroom operations it was expected women would perform in this plant. In another, boys with only trade-school experience had been started on cutter grinding in the toolroom; women could easily do this work.

Women could take over not only the easier and less-skilled jobs in toolrooms if the work is adjusted to their limitation as machinists, but they could be upgraded to perform toolroom operations requiring considerable skill. They have been doing such work in Great Britain at least since 1941.

INSPECTION

The organization and arrangement of inspection work differs from plant to plant. Some companies employ floor inspectors who go through the departments and inspect any work that appears to need checking. These and others may provide also for the inspection of the first piece of each lot. Some firms have inspection centers where the work done in certain departments is thoroughly inspected before it is sent on for further processing in others. A combination of any of these methods may prevail and, in addition, final inspection of all parts may be made before delivery to the stockroom.

All companies provide for the final inspection of completed machines. Ordinarily this is handled by a separate inspection force working on the erecting floor. The work often involves also test running after assembly. It requires special skill and experience and therefore is kept in the hands of experienced men. None of the machine-tool plants visited were considering women to do this kind of inspection. It was being contemplated, however, by an official in one Ordnance District at the time of visit and it is said of one of the machine-tool plants that newcomers are showing such surprising aptitude that they will soon qualify for this work.

Plants with subcontractors usually have a force assigned to the inspection of incoming parts. Sometimes, however, it has been found necessary to set up field inspection at the place of manufacture.

Women inspectors were employed in most of the plants visited in which women were engaged in productive work. None were employed as line or general inspectors, usually highly skilled workmen who can perform any kind of inspection work. The women were doing in-process inspection; a few, final inspection of small parts. Most read blueprints and used such precision instruments as micrometers, calipers, scales, dial indicators, and various types of gages.

Gears were inspected by means of such devices as microscopes, comparators, checking gages, cone machines, and Red Liner machines.

Though a few plants put much of the responsibility for certain kinds of inspection on department foremen or group leaders, most employed a considerable group devoted exclusively to inspection work. Where this was true, there were many operations on which men were employed for which women could have been hired. In one plant a good deal of gear checking was necessary. The work was done with a Red Ring gear checker and Red Liner gear recorder, machines a woman could operate easily. There were men detail inspectors also whose place women could have taken. In another plant women could have been trained to do a considerable proportion of the inspection work, much of which took place in numerous inspection centers and some in the gear-cutting department. Since the Women's Bureau visit to this plant women have been put on this work and several other firms have planned to employ women for inspection, mostly of small parts, some of it to be performed on subcontracted goods. Where women already are working as inspectors, their numbers could in most cases be greatly increased.

Detailed and careful inspection is a field in which women have long excelled in many industries. Women have been found exceedingly conscientious, painstaking, and accurate in inspection work. This is the kind of employment in which they are said frequently to surpass men. The foremen in one of the machine-tool companies where they were employed as inspectors reported that women picked up the work faster than men, followed instructions better, and were more careful in making precision measurements and checks. The total number of experienced male inspectors needed by many firms could be reduced considerably if women were employed generally to check all the small parts in inspection centers. Women could check heavier parts also when lifting is not required and later could be upgraded to the more highly skilled branches of the work.

Inspectors' training is easily acquired and can be taken conveniently in defense training classes. Instruction in the use of measuring instruments, the reading of blueprints, and shop mathematics was available in several machine-tool centers at the time of visit through various types of public vocational schools, or schools operated under private auspices. A complete course specially set up for inspectors' training was being given in Worcester, Mass., by two trade schools. Such instruction is effective not only in presenting the needed material to the student, but in giving her ease and familiarity with the instruments. One must have practice in the use of a micrometer, for example, as well as knowledge of how to read it, since accuracy depends in part on getting the "feel" of the instrument. One of the firms visited had introduced an inspection course within the plant for those who qualified after one week of vestibule-school training. The trainees were taught the use of gages and measuring instruments, shop mathematics, and blueprint reading, and learned on the job also. They were put to work inspecting parts made in outside shops. These usually were received in large lots and so gave the new inspector practice on repetitive work. After a few inspection operations on a single part were explained, the newcomers could work for a considerable time, thus acquiring skill while being productively employed.

ASSEMBLY

Assembling of the many parts, large and small, that go into the complete precision instrument, the machine tool, is an extremely important part of its manufacture and one that claims a large proportion of the workers in the plant. In the machine-tool firms visited, assembly work occupied more employees than any other part of the manufacturing process except machining. It accounted for 15 percent of all those employed in the 13 plants reported and nearly 24 percent of the productive workers.

The fit of the many small parts and major units of the machine tool must be so carefully and expertly produced that the tool functions smoothly and to the required close tolerances. If this is not the case, all the previous labor is lost. The assembly process demands precise leveling of the machine on the assembly floor, the exact alinement of various units with each other, and then many fitting operations involving scraping, filing, tapping, and other hand and machine processes.

As assembly is customarily organized, one man does a considerable variety of the work. Because of the skill required under such an arrangement and also because of the heavy parts to be handled, plant officials interviewed generally considered it unlikely that women could be employed in final assembly or erecting departments and, in many cases, on subassembly work also.

In most plants some units are assembled separately and then attached to the machines during final assembly. Among the subassemblies being made in some of the firms visited were gear boxes, headstocks, tailstocks, taper attachments, aprons, feed shafts, spindle heads, and control levers. When one man assembles an entire unit, he must have considerable skill and experience, proficiency with a good many hand tools, ability to do a variety of bench operations, and in addition a certain amount of physical strength, since some of the parts to be handled are much heavier than others.

But in many cases it is unnecessary that so many operations be performed by one person. The all-round job of the skilled assembler may be broken down into components, and when this is done, especially in the case of subassembly, many inexperienced women may be employed. Women were already working as assemblers in two of the plants visited by Women's Bureau agents and in both the number was to be increased. Another plant had made plans to employ women on subassembly very shortly. Some of the women already employed were filing, burring, and polishing with emery cloth, and they were using hand drills and small arbor presses on such units as the feed shaft, feed box, apron, and head-cover unit. The lighter work had been separated from the heavier in one plant so that women could be employed; in fact, the work had been so arranged that women were not required to handle any parts weighing more than 18 pounds. Men were working on heavier pieces and on operations requiring greater skill. In another plant women assemblers were doing not only the kinds of simple and light operations already mentioned, but in addition some had been given the responsibility of assembling parts of subassemblies. For example, they were assembling the cross-feed screw nuts, "building" the taper attachment shoes,

making the lever and hand assemblies, and, in connection with the gear box, fitting the gears on small shafts, assembling shoes, hand reaming and hand tapping, filing, and painting the inside of the box. Women assemblers had proved so satisfactory here that a large proportion of the women to be taken on in the future were to be placed in the assembly department. At the time of survey, 7 in every 10 women productive workers in this plant were on assembly jobs.

The few companies that acknowledged that women could assist in subassembly operations were not the only ones where a considerable amount of light assembly work requiring only moderate, little, or no skill was observed. In one plant 6 men were employed in the subassembly department doing nothing but filing and burring. Women could take over this work on the lighter pieces. In another, where attachments were being assembled by men, much of the filing and polishing and the lighter assembly work could be done by women. Men were drilling holes and putting in bushings as part of the subassembly work in another firm; women could do this. One company had an entire department devoted to tool assembly in which there was a considerable amount of light work women could do, especially if some of the operations were broken down. In the same plant there were a great many small and light bench jobs in connection with machine-tool subassembly on which women could be employed immediately. As the work was then arranged, one man might handle some jobs during the course of a day which would be too heavy or too difficult for a woman, but simple planning would permit the release of numbers of men and the employment of women in their places. The foregoing are but a few examples taken at random.

Unless the work is greatly diluted, there is admittedly little that the average woman can do at present in the final assembly or erecting departments, except on the smaller machines. The work is generally too heavy and too highly skilled. Women can put in oil lines, however, and, as they already are doing in one plant, they can clean and polish the completed machines. In some cases there may be full-time bench work that women could do in connection with final assembly. One of the companies visited was planning to employ women final assemblers on the smallest machines they manufacture, to do light fitting as well as polishing and cleaning. Some consideration was being given there also to hiring women as part of a group to perform certain additional operations. It was suggested that one woman and two men might work together. This is similar to the plan in a large machine-tool factory in the Midlands of England where, working with men in gangs, women help to assemble the machines by fitting keys, tapping holes, and even scraping surfaces and bearings.

Considerable hand scraping is necessary in machine-tool assembly in order to "true up" flat surfaces or prevent "rock" between two parts that are to be attached. When red lead is smeared on the surfaces to be scraped and the two surfaces are rubbed together, the "high spots" on the metal can be detected. These are then removed by applying pressure with a hand scraping tool. The process of smearing red lead over the surface and of scraping off the high spots may have to be repeated many times. Scraping large surfaces is very hard work and too strenuous for the average woman, but women can

scrape smaller pieces. As a matter of fact, one of the firms visited that employed women to do scraping in the earlier war has placed the job of "light scraping on small parts" on its summary of occupations for which women may be employed, when finally taken on, in the present war. Another company also has suggested light scraping as a possible job for women. An instance was cited in each of two plants, however, of a woman who tried scraping but found it too difficult. In one case the woman had to lift a surface plate to rub it over the surface to be scraped. The plate was too heavy for her to lift as often as was necessary in the performance of her work. If a hoist had been available, the actual scraping might not have proved too difficult.

Women are doing heavy as well as light scraping in Great Britain. Reports from one British machine-tool plant show women doing the majority of the scraping; four women divide the job on the 30-foot bed of a planer-miller. In another British plant women scrape lathe beds and bed-in the saddle, cross slide, and other movable parts of the machine. The operations on the cross slide are particularly difficult in that two pairs of flat surfaces and one oblique pair have to make contact on each side at the same time. After 8 months on the job one woman was able to grind and stone her own scrapers and had trained eight other women in the work.

Assembly operations involve, in addition to scraping and fitting, a certain amount of electrical work, such as wiring and the installation of motors and switch boxes. In some plants maintenance electricians do this work, but in others the electrical assembly is handled by a separate group of workers. The wiring of switch boxes and other light electrical operations noticed in several firms were said to require more skill than the average inexperienced woman would have.

Actually, however, two companies already were employing women on electrical assembly work at the time of visit and one other was preparing to take on a number of women for electric-panel wiring. In both plants where they were already employed, the women were doing typical electrical assembly bench work consisting of wiring panel boxes, soldering, cutting wires, attaching wires to terminals, and the like. One of the companies had employed women in this work for more than 2 years. The other was intending to employ more women on electrical work as the men in the department were drafted. The company where women were soon to begin panel wiring had already constructed the work tables, which contained pigeon holes for the various parts to be used. It was planned to have the women follow numbered diagrams that had been broken down and simplified by the plant's engineering department. Several factories were visited in which much the same technique could be used or special supervision could be provided for women, thereby releasing a number of men for more skilled or heavier work. In two of these, young boys were doing the electric-panel wiring. In contrast, one plant in Great Britain is reported to employ women to do the complete wiring job on two sizes of turret lathes. The operation includes wiring a 4-speed motor and speed change gear and it entails also soldering lugs to the wires and fitting conduits. The women work from diagrams.

MISCELLANEOUS NONPRODUCTIVE OCCUPATIONS

There were several nonproductive departments in the machine-tool plants visited in which women could have been much more extensively employed. These include the general and shop offices and the tool cribs. In the plants visited women comprised only 4 in 10 of all the workers in the central office. The proportion varied, however, from 13 percent in one plant to 64 percent in another. In every plant the proportion could have been greater. This is a sphere in which women's competence usually is unquestioned and one in which there are women who can immediately qualify for the more responsible as well as the routine jobs, thus making it possible to replace numerous men who could be employed more advantageously in the armed services or in technical or skilled work.

In the machine-tool factories visited, few women were employed as timekeepers, clerks in production departments, tracers, stock clerks, and the like. In some companies the claim was made that stock chasing in particular is a man's job because it requires intimate acquaintance with the business, enabling the employee to find parts and take them to the proper departments on his own initiative. It is true, of course, that stock chasing may be a much more responsible job and, especially when combined with other work, a heavier job, in some plants than in others. Certainly, however, with planning and direction, in almost every plant some women could participate in it. Without question women could take over most of the other factory clerical jobs, including timekeeping.

Only three of the firms surveyed employed women as tool-crib attendants. In one of these the women were known as tool dispatchers, since in connection with their tool-supply work they took the tools to the machine operators so that the latter need not leave their machines. Where heavy jigs and fixtures must be lifted from the shelves, some men would have to be employed, but women could do most of the work as all that it requires is acquaintance with the tools and their places in the crib. Women have been very apt in learning this job in other industries. The many tool cribs in a large airplane-engine plant recently visited by Women's Bureau agents are manned almost entirely by women.

The three lines of work just discussed—general office, shop office, and tool crib—claimed in the 13 plants reported about 8,000 workers, of whom not quite one-third were women. Yet women could have filled well over half and perhaps the great majority of the jobs, thus freeing many hundreds of men in these plants alone.

There are considerably fewer workers employed in gage inspection, laboratory work, experimental design, pattern making, or factory supervision in machine-tool plants. Further, most of the occupations involved in such work ordinarily require extensive background, skill, and experience, thereby precluding the immediate employment of women in most cases. Some women are adequately qualified to take over gage inspection and certain kinds of laboratory work, but practically none were employed. To be sure, the total number of employees affected would be very small. In connection with pattern making, women could serve as helpers and after a while as plain pattern makers. In Great Britain they are disk sanding, band

sawing, shellacking and painting patterns, and putting in the many screws and nails required. It is interesting that in one of the American machine-tool plants visited in which a schedule of jobs to be opened to women had been drawn up, the occupation of plain pattern maker was included in the original list. Women will not be employed in this work at first, however.

With so few women employed in the plants visited even in unskilled and semiskilled productive jobs, it is perhaps visionary at this juncture to suggest foremanship as a possible job for women. But where sizable groups of women are already working, as in small-tools departments and inspection centers, women supervisors are by no means out of the question, and as women gain in numbers in machine-tool production it is all the more feasible that some be upgraded to supervisory work. As a matter of fact, according to one plant superintendent there are some supervisory jobs that do not require a great deal of technical knowledge. He said women could start in such work and, as they proved capable, be advanced to supervision requiring more background and ability. British factories have had very favorable experience with women "charge hands." They have found supervision of women by women in many cases more successful than male supervision, for several reasons: Charges of male favoritism then disappear; the worker gains confidence from seeing that another woman has become expert on the work she is asked to perform; and the woman supervisor remembers where her difficulties lay in her comparatively recent experience as a learner.

Factory maintenance, receiving and shipping, service and stock work claim a not inconsiderable proportion of the total personnel, but few of the jobs could be taken over by women. The maintenance work demands highly skilled millwrights, electricians, carpenters, tinsmiths, and the like, usually older men. Receiving and shipping involves packing and crating the finished machines and other work too heavy for women. Women could be employed, however, to pack and ship the smaller accessories in companies where these are made in addition to the machine tools. At the time of visit one company was planning to employ women for this work. Women could also be hired for the clerical work in receiving and shipping departments and as counters and checkers. Two of the firms in the survey employed several women to keep stock records and in two companies women were handling the lighter types of stores.

Service work includes factory housekeeping and, in addition, such jobs as trucking and crane operating. Women could be employed in all three capacities, though very few were seen and in only two firms, where they served as janitresses. Another company was considering the possibility of taking women on for light cleaning. Certainly women could serve generally as chipmen, collecting the metal scraps that come from the machines as they operate. The boxes used to hold the chips should not require lifting, but should be transported from place to place on wheels or rollers. Women could drive small electric trucks within the plant if seats were provided for the operators, and they could handle many of the cranes used in machine-tool plants. They are driving cranes in other industries in this country and women in Great Britain are known to be operating cranes with a lifting power of 10 to 40 tons. In fact, crane driving is now virtually a woman's job there.

CONDITIONS OF WORK AND PERSONNEL PROBLEMS AND PRACTICES

Hours.

Factory employees in machine-tool manufacture are working longer hours than those in almost any other war industry. The average workweek over the period October 1942 to February 1943 was between 53 and 54 hours.

This situation stemmed from the tremendous speed-up that took place in the industry when war began in Europe, making it difficult to secure workers and to set up a second and especially a third shift. A number of firms, therefore, operated 2 long shifts instead of 3 shorter ones. But even in plants with 3 shifts, the hours tended to be long. About half the companies visited operated 3 shifts, but in only one of those was a 48-hour week scheduled for men at time of visit. The weekly hours of men in the remaining 3-shift plants ranged from 52 to 60. In most cases hours for men exceeded those for women; in all but one plant at least 52 hours a week, and in several plants a scheduled week of 60 hours or more, was customary. Women, on the other hand, were employed 48 hours or less in 6 of the 8 plants in which they were engaged in factory work. In the other 2 firms the hours were the same for women as for men, 11 hours a day and 55 hours a week on the first shift, 11½ hours daily and 57½ hours weekly on the second. (Only one of these firms employed women on the second shift.) Two weeks in eight all workers were on a 6-day instead of a 5-day week, the daily hours remaining the same; the averages over the year thus became respectively almost 58 hours and just over 60 hours. Exemption from their State hour law providing that women be employed no longer than 50 hours weekly or 9 daily had been allowed these firms.

Except for the two cases just cited and an 8½-hour schedule on one second shift, women were working 7½ or 8 hours daily, but in few cases were men on the 8-hour day. Furthermore, in most plants where men worked but 7½ or 8 hours a day they were expected to put in a 7-day week. In some instances the men were assigned 7½ or 8 hours one or more days in the week, but 10, 11½, or 12 hours the remaining days.

These hours are long in comparison with the recommended 40-hour week for peacetime and the 8-hour day and 48-hour week recommended for sustained efficiency in wartime by the War and Navy Departments, the Maritime Commission, Public Health Service, War Manpower Commission, and other interested Federal agencies. The consensus is that though hours in excess of 48 a week have been necessary in some instances because of a limited supply of supervisory and skilled manpower, there has been a tendency to continue the longer schedules after sufficient opportunity has been afforded to train additional workers. A committee representing eight Government agencies interested in maximum production recommends that plants employing workers longer than 48 hours weekly analyze their situation with respect to output and time lost because of absenteeism, acknowledged to be due chiefly to accidents, illness, and fatigue. The 8-hour day and 48-hour week does not prevent round-the-clock and 7-day operation.

Most of the plants visited approximated the goal of 24-hour production with a variety of shift schedules organized on the basis of

either 2 or 3 shifts. Long daily hours were in two instances tempered by 2 days off after 6 days on the job. In one plant where women were employed 11 hours daily, they worked 3 days and were then off 1 day. In some cases, as already stated, there were 4 or 5 long days combined with 1 or 2 short days. Two plants scheduled the first shift for 2 days of 12 hours and 4 days of 8 hours in a 6-day week. These are but a few examples from a wide assortment of shift schedules and practices, most of them directed toward production for all or most of the 24 hours, combined with adequate maintenance time, and, where women were employed, adjustment to the statutory requirements of the various States regarding women's hours. However, though the plants were generally operating round the clock, the great majority of the men as well as the women were on the first shift, illustrating that full utilization of plant facilities had not been achieved at the time of the Women's Bureau visit. Over half (52½ percent) of all the men and 84 percent of all the women in the plants reporting were on the first shift and only about 17 percent of the men and 8 percent of the women were on the third. Rotation was not generally practiced.

A weekly day of rest was the rule in most of the companies. In several, 2 days were customary after 5 long days of work. Though in no instance were women required to work more than 6 days in 7, in three plants men were on a full 7-day workweek. In one of these the men were given one day off every 3 weeks, the time being made up on that day by each of the other shifts working 4 extra hours. In another, an 8-hour day was considered sufficient offset for the day of rest. Some of the men in the third company were on 9-, 10-, and 11-hour shifts and in addition worked a 7-day week. The War and Navy Departments recommend that "Only in extreme emergencies and for a limited period of time should workers or supervisors forego the weekly day of rest." They assert, with other Government departments interested in maximum output, that the 7-day workweek is injurious to health, morale, and production.

At least a 30-minute meal period, a necessity from the standpoint of the worker's health and efficiency, was customarily allowed men as well as women in most of the companies in the survey. In a few cases, however, men were required to eat their lunch in 10, 15, or 20 minutes, or as time permitted on the job. Some plants provided, in addition to meal periods, regularly scheduled rest periods of 10 or 15 minutes morning and afternoon. These are particularly helpful in preventing excessive fatigue and thereby increasing efficiency.

Methods and rates of pay.

The principle of equal pay to women who are doing similar or the same work as men was not generally in force in the machine-tool firms visited, at least as far as entrance rates were concerned. Only one of the eight firms in which women were employed on productive work operated under this principle. In the others, women entered at 5 or 10 cents less per hour than men. Women's entrance rates ranged from 40 to 60 cents, men's from 50 to 65 cents in the firms hiring both men and women. Furthermore, because of their very recent accession to the labor force, women in most cases had not advanced beyond their starting rates.

The reasons given for the sex differential varied. Some firm officials said that women required more supervision—that they had no

background or experience in mechanical work; others that they did not work so long a shift as men because of State maximum-hours provisions; some that they must prove their efficiency first; and so on. One company had in the beginning given women the same entrance rate as men, but the men complained, and as a result the men's beginning rate was raised 5 cents.

It is the considered stand of the National War Labor Board and the Women's Bureau that to maintain all-round industrial efficiency and industrial democracy women should be paid the rate for the job and that rate should be set without regard to whether a man or a woman will perform it.[1] It is significant in this connection that one of the machine-tool companies showing a differential in the summer of 1942 was, early in the fall, directed by the War Labor Board to standardize and simplify its wage schedules and to include in its agreement with the International Association of Machinists, A. F. L., a clause adopting the principle of the same pay to women who, "in comparable jobs, produce work of the same quantity and quality as that performed by men." In its written opinion the Board stated specifically that to be specially guarded against is the procedure of cutting women's rates when the extra labor introduced for heavy work, setting up, and so forth, does not increase the unit cost of production. It has often been found that the hiring of a special set-up man or moveman for a group of workers may actually reduce unit costs of operation, even though hourly rates are maintained.

Most of the machine-tool plants visited operated under wage plans involving a base rate plus some form of individual or group incentive scheme or production bonus. In 5 of the 15 companies a straight time rate only was paid, and in 1 a straight piece rate, the rate being guaranteed for the job in all factory occupations except inspection and stock-chasing. Where piece rates were set in connection with a production bonus, they generally were computed on the basis of job classification and requirements, the same rate being paid regardless of the sex of the worker. But since the base rates were not alike, the sex differential remained.

A regular wage-advancement policy was in effect in 7 of the 15 plants surveyed and in 3 of those reporting women operatives. In general, the scheduled raises were given in 5-cent intervals until the job rate was reached. The total advancement amounted in most cases to 10 cents an hour. In two plants where the entrance rates for men and women differed, only the women were raised until they reached the starting rate for men. After the job rate was reached, in plants where regular pay raises were made and in companies where no regular advancement was provided for, increases were given usually on an individual basis, depending on foremen's recommendations with regard to efficiency and merit, length of service, and the like.

Special wage differentials generally were paid all those employed on the evening and night shifts. In two plants this amounted to as much as 20 percent above the worker's regular rate. In most cases, however, it was a matter of 10 percent or 5 cents an hour, the bonus being generally the same for the third shift as for the second. Only 1 of the 15 firms visited did not pay a shift differential.

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[1] See Women's Bureau Bul. 196, "Equal Pay" for Women in War Industries. 1942.

Recruiting, training, upgrading.

The machine-tool plants employing women in the shop did not make very rigid requirements of women recruits. None of them insisted on previous shop experience. Furthermore, though defense training courses were available to women in each of the towns where the plants visited are situated and many women already hired had attended them, preemployment training was not generally required. All the plants accepted married as well as single women. One, however, reported a preference for single women and another would not hire the wives of their men employees. Half the firms would not accept women under 21 and half set 18 years as the minimum age limit. Only two stipulated a maximum age; one set 40 years, the other 50.

At time of visit a large proportion of the hiring was done at the plant gate. Four factories in which women operatives were employed secured most of their personnel in this way. Several, however, were making extensive use of the United States Employment Service facilities. One plant made new hires exclusively, and one almost exclusively, through the U. S. E. S.; even when applicants came to the gate, the company first named sent them to the U. S. E. S. before granting them an interview.

Though women who have attended defense training classes find jobs in machine-tool plants, personnel was not customarily secured directly from the schools except by two companies. These are in the same New England town, where a special cooperative training school under public-high-school authority has been sponsored for nearly 25 years by the local industries. The high-school machine-shop classes were held in space provided on the property of one of the companies and with machinery donated by several affiliated firms. The same machine shop was being used as a National defense training school in the summer of 1942, with both men and women enrolled. One of the cooperating machine-tool firms was getting most of its women employees from this school. Another used this school and in addition canvassed defense schools in other parts of the State and adjoining sections.

Trainees in the New England school just mentioned were being taught first the use of the micrometer and of all types of precision measuring instruments such as calipers, vernier gages, plug gages, dial indicators, and the like. Next they were taught to read blueprints and to set up machines from blueprints. In addition the students were trained in the operation and set-up of an unusually diversified and complete array of machines. The course required about 160 hours over a period of 6 to 8 weeks. Classes were held 24 hours a day and 7 days a week. The school admitted women in April of 1942, and when visited in July, 85 women had completed the course. Most of them were employed in three machine-tool plants. The supervisor of training reported that the women listened more carefully than men to instructions and were more painstaking in their work. They were slower than men at first, but their spoilage was less. The supervisor stated also that the women were able to work to close tolerances in a very short time.

In Cincinnati, often called the machine-tool center of the United States, approximately 72 percent of the vocational training sponsored by the U. S. E. S. was in machine-shop work. There were 12 machine

shops and 98 machine-shop classes, all open to women since February 1942. In August of that year fully one-third of the total enrollment were women and it was estimated that one-fourth of those already trained had been placed. The schools stressed production and actually turned out numerous machine-tool accessories and various machines and machine tools for use in their shops. At the time of visit one well-equipped school shop was making or planning to make 100 3-horsepower motors, 12 centering machines, 250 milling-machine vises, 25 complete hand-operated milling machines, and 500 drill-press vises. Besides the machine-shop work, related instruction in blueprint reading, shop mathematics, and the use of precision measuring instruments was given. The courses required 300 hours to complete, but most of the trainees secured jobs and left before finishing.

The NYA school in Cincinnati, devoted almost entirely to training Negroes, operated three 8-hour shifts a day. Classes were coeducational. All the work in the school shop was production work for which orders had been received. According to the instructor, machine-tool firms would not take down a set-up for small jobs, so the training school got such orders. The usual related training was given also. The difficulty was that Negro women, in spite of this training, were not accepted for productive work in this area.

A course in inspection sponsored by the Ordnance Department and providing training in mathematics, blueprint reading, mechanical drawing, the use of precision measuring instruments, and metallurgy completed the training picture in Cincinnati.

Machine-shop and inspection courses, most of them under public auspices, were open to both Negro and white women in other machine-tool centers. In one important area a course for women supervisors had been started as an experiment.

The demand for women workers in the various war industries has been so great that many leave the training schools before they have completed their course. Many others do not enter training because they can secure paying jobs without benefit of preemployment instruction. The attitudes of the machine-tool firms visited varied considerably toward the defense-training-school work. Some reported at time of survey that they took students from the schools whenever possible and considered the preemployment instruction valuable. Others in the same area with access to the same schools preferred to train their own workers. They complained of lack of success with the school trainees. Still others appeared to be indifferent; in fact, seemed to do their hiring without regard to whether or not the applicant had school work that would serve to familiarize her with shop procedures and terms.

This doubtless arose from the fact that machine-tool plants were in many cases training their new women workers themselves either directly on the job under experienced workmen or in their own vestibule schools. In at least one instance, however, where a vestibule school for women was in operation, the time that trainees had to spend in classes depended in large part on whether or not they had had previous training in a defense school.

The instruction given women in vestibule schools varied in its thoroughness. In one plant, foremen gave 3 days of training to all new women employees. The instruction consisted of blueprint read-

ing and the use of the micrometer and other measuring tools. After this, the women were assigned to a machine with a man worker and trained on the job. A company representative said that inexperienced women could be trained by the plant in 3 days to use measuring tools as well as if they had previously attended defense classes. A more elaborate training program was in operation in a second plant where the women remained in school an average of from 3 weeks to a month. Some were there 7 weeks, and others a day or so. Some women did not have to enter the school at all if they had received sufficient preemployment training in the defense school. The firm's vestibule training comprised 1 to 1½ hours of classroom work each day and instruction in the use of measuring instruments, in assembly work, and in machine operations. The girls were started on scrap material, but as they became more efficient were put on production work. At the time of visit women were learning to set up work, though special set-up men might be hired for some of the machines on which women eventually would be placed.

An even longer and more elaborate training program was in operation in a third plant. Here all women employed were given, first, one week of classroom instruction during which they learned the fundamentals of blueprint reading and the use of measuring instruments. In this period, also, they were lectured concerning health, dress, company policies, safety, and the like. For another week in the plant's trade school the women were taught to identify the machines and from here they went into the shop, where they were given a 12-week learnership course. They were paid while in training.

No additional or supplementary training was being offered women in the plant after induction, but in every center where the firms were located ample opportunity existed for taking additional work in defense classes. Women were not being considered for apprenticeship training and in fact this type of training was practically discontinued for men in favor of short-term learnership programs or on-the-job instruction.

The firms hiring women operatives reported that they included them in their upgrading program. Several stated that women were already being upgraded to set up their own machines. In one plant one or two women had been advanced to more difficult machines.

Turn-over.

The consensus was that women's turn-over was low, men's high, mostly because of the draft and enlistments. In fact, at least 2 plants began to take on women principally because of the high turn-over among men. One employment director said that the turn-over in his plant would decrease as more women were employed.

Medical services and related problems.

Industry has for some time been aware not only of its responsibility to the worker to provide adequate treatment in case of illness or accident while on the job, but of the dividends good medical facilities pay in factory morale and reduced absenteeism. Most of the machine-tool plants visited had a well-appointed medical department in which first aid was administered or minor treatment given. A nurse generally was on duty at all times and a doctor was on call. In a few cases one or more doctors were in attendance at the plant for

all or part of the day. One firm provided home-visiting service. The smallest company, on the other hand, had only a first-aid station tended by a worker with some training; a doctor was on call in case of accident.

The medical service in a good many of the plants included also a thorough preemployment physical examination. Some companies had X-ray equipment. Most gave blood tests, took the blood pressure, and examined eyes, ears, nose, throat, heart, and lungs. Men were examined for hernia. A number of the companies that gave preemployment physical examinations employed women operatives. These companies had several advantages over those also employing women but giving no physical examination. Not only could their personnel managers on the basis of the medical information weed out women totally unable to do factory work or for whom physical exertion would be dangerous, but they were able to allocate more wisely those women who were hired. This is especially important where the women's work may involve lifting or other strenuous physical activity. Providing the best possible arrangement of the work and as many handling conveniences as possible eliminates a large part of the problem, but proper choice of the woman for the job is essential also. Women who will have to lift heavy materials or perform other work requiring a good deal of strength should have a physique enabling them to do the work and should be informed concerning the proper methods of doing it with least exertion and danger to themselves.

The question is raised frequently as to the maximum weight women should be asked to lift. According to the research division of the Women's Bureau, "the scientific establishment of a maximum that would apply to all women is impossible. All the elements in weight lifting, such as compactness of load, levels of lifting, and so forth, must be considered as well as the physical characteristics of the individual who is to do the work." [8]

In ordinary times women workers in this country are seldom required to lift over 25 pounds. Wartime employment, however, may involve lifting much heavier loads. A recent study by the Division of Labor Standards of the United States Department of Labor suggests as over-all limits for employees in general a 25-pound maximum for women, a 50-pound maximum for men.[9] The British allow a maximum for women that is twice as great, 50 pounds for continuous work, 65 pounds for intermittent work. American authorities feel that if specific limits are set, this is too high.

Uniforms and safety-clothing regulations.

Safe, convenient, comfortable, and attractive work clothing for women war workers is widely recommended.[10] The clothing need not be uniform, but uniform or not it must be safe. Proper factory garb can make all the difference between freedom from accident and disfigurement or even death.

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[8] See Women's Bureau Special Bul. 2, Lifting Heavy Weights in Defense Industries: Methods for conserving health of women workers. 1941. This report summarizes the problems involved in weight lifting and methods of protecting women employed in such work.

[9] U. S. Department of Labor. Division of Labor Standards, Guide to the Prevention of Weight-Lifting Injuries. Special Bul. II. 1943. p. 13.

[10] Recommendations of the Women's Bureau in this field are summarized in its Special Bul. 3, Safety Clothing for Women in Industry. 1941.

All machine-tool plants visited in which women operatives were already employed were safety-clothing conscious. Most of them had adopted a uniform and cap for plant wear. One company furnished the uniforms to their women workers; the others asked the women to buy them. The cost, reported in only two instances, was around $3 an outfit. In one plant the women were said to have 2 or 3 each. In one of the companies women operatives were not required but were advised to wear the adopted uniform, since special clothing was not required of the men. The women who did not wear the uniform were requested to wear a suitable substitute for it in the way of a coverall or slacks. Women engaged in machine work were generally required to wear special headgear. Sometimes a hairnet or kerchief was specified. Kerchiefs, however, may expose the hair, or machines may catch loose ends of cloth. A hairnet alone is not safe either, but worn fully under a cap it may help. Height, stiffness, and generous headsize are essential in a safety cap, so that it will cover all the hair, give warning of dangerous approach to the machine, and be quickly lifted or knocked off in case of necessity. Above all, the hair should not be allowed to show beyond the cap. This seems to be one of the most difficult plant rules to enforce, but it is extremely important because of the many serious injuries that have resulted from exposure of women's hair near moving machinery.[11]

Low-heeled shoes were generally required; in one company most of the women had purchased safety shoes at a cost of from $4.50 to $5.50. Goggles and shields for work involving danger to the eyes and face were provided as needed.

Food service.

Hot food generally was available for purchase by the workers on all shifts, except in a few plants where sandwiches and light refreshments only were provided or where the workers had to carry their lunch or go out to eat. Of 15 plants, 7 had a cafeteria, 5 of the 7 being firms where women operatives were employed. In some places lunch carts carried hot or cold food to the workers on each shift. One plant allowed a caterer to come in at lunchtime with sandwiches, hot soup, and coffee. Where lunching facilities were not available many carried food to work and ate it at their workplaces or in rest rooms. One plant provided lunch-room space for this purpose. A company having a cafeteria also sent a cart through the plant morning and afternoon with hot coffee, milk, orange juice, soft drinks, and ice cream. Employees were allowed a reasonable time off for refreshments.

In the machine-tool plants visited, the most usual lunch period was 30 minutes. This is sufficient only if washing facilities and lunchrooms are conveniently located so that the worker has enough time to leave the workroom, wash, eat a well-balanced meal, and have a few minutes for leisure afterward. If the cafeteria or lunchroom is inadequate to serve an expanding force without delay, or if it is distant from the workroom, additional time should be allowed or provision made for carts with hot food to serve lunches at convenient points outside of workrooms.[12]

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[11] See Women's Bureau Special Bul. 9, Safety Caps for Women in War Factories. 1942.
[12] Women's Bureau Special Bul. 5, Women's Effective War Work Requires Time for Meals and Rest. 1942.

Tool kits.

It is customary in the machine-tool industry for workers to furnish a good many of their own hand tools, such as micrometers, scales, and other miscellaneous equipment. The tools needed vary with the job. In one plant it was said that the cost to women is generally between $10 and $20, the higher in the toolroom. Another company planning soon to employ women would furnish the more expensive tools such as Johansson Blocks, but would require the purchase of others. The latter would be bought by the firm and resold to the women, who would pay for them in installments. Since most women in the industry probably will be employed only for the duration or not long after, this expense must be kept low.

Personnel work: Selecting and counseling versus policing.

Women matrons, counselors, or personnel officers had been introduced into all but two of the plants in which women operatives were employed. Their functions varied extensively. In one plant matrons were employed expressly to "control" the women and keep them from soldiering on the job by too frequent visits to the rest rooms. Not far above these women in status and effectiveness were the matrons in two firms who, in addition to their duty of seeing that the charwomen or janitors kept the women's rest rooms clean, were expected to handle problems brought to them by the factory women and act as go-between to the personnel department.

The woman personnel officer in another company had still different functions. She was employed before any women operatives were taken on to try various jobs in the plant herself and then advise the personnel office concerning those she thought women could do successfully. This continued to be her main function as more and more women were employed. She had no authority in the selection of women nor in counseling them, but once they were hired she familiarized them with plant facilities and regulations.

More professional and well-defined were the functions of the woman personnel officer in each of two companies. These women interviewed women applicants, hired them, and acted as women's counselors. One of the women, in addition, lectured trainees on such topics as health, dress, and safety. These personnel officers had an important function in the plant and because their function was well-defined and well-implemented they, as women, could give valuable service, especially if they had the proper qualifications for the job.[13] These capabilities should include varied industrial experience in addition to a good education and a personality and manner that preclude prejudice and inspire confidence. A woman personnel officer, furthermore, should be interested in her fellow women workers and their capabilities. She should have detailed knowledge of the jobs to be filled, conditions in the plant, and the types of work which women are fitted to do. When aptitude tests are given, she should be competent in their interpretation. A woman personnel officer equipped in this way can be of great service in an industrial organization where large numbers of women are being employed for the first time.

[13] See Women's Bureau Special Bul. 12, Choosing Women for War-Industry Jobs. 1943.

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, Secretary
WOMEN'S BUREAU
MARY ANDERSON, Director

Women's Employment in the Making of Steel, 1943

By

ETHEL ERICKSON

BULLETIN OF THE WOMEN'S BUREAU, No. 192-5

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June 22, 1951

Plants included in the Steel report

"Women's Employment in the Making of Steel, 1943"

American Steel and Wire Co.		Donora, Pa.
Bethlehem Steel Co.		Bethlehem, Pa.
" " "		Lackawanna, N. Y.
" " "		Sparrows Point, Md.
Byers, A. M. Co.		Ambridge, Pa.
Carnegie-Illinois Steel (17 plants)		
-	Duquesne Works	Duquesne, Pa.
	Gary Works	Gary, Ind.
	Homestead Mills	Pittsburgh, Pa.
	South Works	Chicago, Ill.
	Youngstown Works	Youngstown, Ohio
	9 other plants	Pittsburgh-Youngstown Area 1/
	3 other plants	Chicago-Gary Area 1/
Colorado Fuel and Iron Co.		Pueblo, Colo.
Follansbee Steel Corp.		Follansbee, W. Va.
Inland Steel		Indiana Harbor, Ind.
Jones and Laughlin Steel Corp.		Aliquippa, Pa.
" " " " "		Pittsburgh, Pa.
National Tube Co.		McKeesport, Pa.
Republic Steel Corp.		Buffalo, N. Y.
" " "		S. Chicago, Ill.
" " "		Youngstown, Ohio
Weirton Steel Co.		Weirton, W. Va.
Wheeling Steel Corp. (5 plants)		(2) Wheeling or near Wheeling, W. Va.
		(1) Martins Ferry, Ohio
		(1) Stuebenville, Ohio
		(1) Yorkville, Ohio
Wickwire Spencer Steel Co.		Tonowanda, N. Y.
Wisconsin Steel Co.		S. Chicago, Ill.
Youngstown Sheet and Tube Co.		Indiana Harbor, Ind.
" " " " "		Youngstown, Ohio

1/ Information on these plants was obtained in Pittsburgh office.

Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, January 10, 1944.

MADAM: The shortage of man labor has led to the employment of women in plant jobs in the basic iron and steel industry, a heavy industry hitherto employing practically no women except in the administrative offices. The Women's Bureau study of women's occupations and of the conditions under which they are at work was made in order that the industry may employ women increasingly in such capacities as the labor shortage requires and experience shows to be suitable for women.

The survey was made by Ethel Erickson, industrial supervisor, assisted by Frances E. P. Harnish, May Bagwell, and Marie M. Wright. The report has been written by Miss Erickson.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,
Secretary of Labor.

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Women's Employment in the Making of Steel, 1943

INTRODUCTION AND SCOPE OF SURVEY

Steelmaking traditionally has been men's business. Steelmaking is a heavy and dirty business and women workers have been taboo. Iron ore, coal, and limestone, the basic raw materials for steel, are earthy, bulky, and heavy. Steel mills spread over wide areas and intense heat and massive equipment are necessary in processing. These marked characteristics of the industry and inherent hazards have tended naturally to shut out women, with their lesser strength and endurance.

In peacetime about the only job within the mills on which women were found was sorting and inspecting tinplate. As assorters, women were considered more efficient than men in flipping the mirrored tin sheets, inspecting for surface flaws, grading and judging the thickness and weight with their touch sensitivity. As assorters, however, women have constituted only a fraction of 1 percent of the employees in the steel industry. Women clerical workers, of course, have been employed in the administrative offices of the companies for many years, but plant-office and pencil jobs of a semiclerical nature within the mills were held almost exclusively by men.

Not until months after Pearl Harbor did the steel industry feel the shortage of manpower sufficiently to consider women as a source of labor for augmenting their force and replacing men. Steelmen—both managers and workers—generally did not welcome the advent of women into their mills and feared that women would not be able to do a full job and would be a disrupting element and liability. The heaviness of the raw materials, the weight of steel products, the massive equipment, the spatial spread, the heat, fumes, and hazards do not offer employment possibilities that normally would be considered desirable or attractive to women. Also, there was a deeply rooted prejudice and tradition against women workers in the steel mills similar to that which prevails in the mining industry.

During 1942 a small number of women began to appear in the laboratories and plant offices of some of the mills, and by the end of the year, in a few mills, there were women on the lighter cranes and on labor gangs around the yards. Most mills, however, did not take on women until 1943, and though by the closing months of 1943 women are working in most of the country's steel mills, their numbers and proportions are small and their utilization is restricted generally to the lighter and least skilled jobs. In some of the mills, however, they are found in almost every department. There are women working at the ore docks, in the storage yards for raw materials, on the coal and ore trestles, in the coke plants, the blast furnaces, the steel furnaces, the rolling mills, and the finishing mills that are doing fabricating on shells, guns, and regular products such as nails, spikes, and bolts. On the whole, management, realizing that much of the work requires strength

or exposure to special hazards, has been cautious in the selection of jobs for women and has provided better service and welfare facilities for women than for men. In old mills, where working conditions are poorer than the prevailing standards, and service facilities are most meager for men, there has been less employment of women than in the more modern mills.

During the late summer and fall of 1943, agents of the Women's Bureau visited steel mills in the principal steel-producing areas. One mill in Colorado had been visited as early as May. The occupations of the women, the hours worked, rates of pay, working conditions, and other factors affecting their employment were included in the inquiry. Data on jobs filled by women were collected for 41 steel mills. The proportion of women in the total force in the 41 mills was 10.6 percent, in the production areas 8.1 percent, and in the administrative offices and on salaried pay rolls 35.2 percent. The proportion of women in production work varied by plant from 3.2 percent to 16.1 percent. The scope of the survey is set forth in the following tabulation:

Area	Number of mills	Employees								
		In all employment			On production			In office and other work		
		Total	Women		Total	Women		Total	Women	
			Number	Percent of total		Number	Percent of total		Number	Percent of total
All areas visited	41	278,986	29,498	10.6	253,024	20,369	8.1	25,962	9,129	35.2
Pittsburgh-Youngstown area	19	119,509	12,073	10.1	107,459	7,952	7.4	12,050	4,121	34.2
Buffalo area	3	15,450	1,318	8.5	13,830	1,014	7.3	1,620	304	18.8
Chicago-Gary area	9	68,285	8,914	13.1	60,644	6,125	10.1	7,641	2,789	36.5
West Virginia	7	21,498	3,312	15.4	20,346	2,676	13.2	1,152	636	55.2
Other [1]	3	54,244	3,881	7.2	50,745	2,602	5.1	3,499	1,279	36.1

[1] One mill in Colorado, one in Sparrows Point, Md., and one in Bethlehem, Pa.

While all the major divisions of steelmaking have women employees, it seems true that the more closely a job is associated with the handling of basic raw materials, the less suitable the job is deemed to be for women. The ore docks, the receiving and storage yards, the coke and by-products plants, the blast furnaces and the steel furnaces—the open-hearth, Bessemer-converter, and electric furnaces—offer an extremely limited field for the employment of women and actually the proportion of the women in these divisions is small. In the rolling mills there are more possibilities of employing women, and there are still more in the fabricating and finishing divisions. The laboratories, the maintenance, service, and clerical divisions, with a large number of jobs that might be considered incidental rather than related directly to steelmaking, probably offer the most in possibilities for the effective utilization of women. The laboratories and plant offices seem to afford opportunities for their continued post-war employment.

Included in Total of 41 plants are 12 Carnegie plants (in addition to the 5 schedules) which were in Carnegie detailed report and 4 additional Wheeling W. Va plants

The steel industry is highly technical and specialized and the visitor going into the plants to observe the work of the women is unable to comprehend many of the intricacies and technologies of the industry. The job terminology used in the plants varies, as does the scope of the duties ascribed to a job. Conditions vary with the size, the modernity, and the product of mills. The objective of the Women's Bureau in the present study of the steel industry is not an exhaustive treatise of the possibilities of employing women in the industry, but a report on the conditions under which women are employed and the suitability of the work for women, since this industry has always been in the category of a heavy non-woman-employing type.

WORK OF WOMEN IN THE STEEL PLANTS

Only basic steel mills were included in this survey. The extent or degree of integration of types of furnaces and mills varied. Some of the plants were fully integrated, with coke ovens and by-products plants; blast furnaces; sintering plants; steel furnaces—open hearth, Bessemer converter, and electric; rolling mills—blooming, billet, slab, bar, rod, wire, plate, skelp, strip, sheet, and tin-plate units; and finishing and final-fabrication departments. Quite a number of the plants visited did not have coke plants, and some did not have blast furnaces or steel furnaces, but all had rolling mills.

Handling of raw materials.

Receiving departments for handling ore, coal or coke, limestone, and other raw materials usually are in or adjacent to the blast-furnace area. Plants on the Great Lakes receive most of their ore supply by boat. Only one plant had women working at the ore docks. The boats are unloaded by electric ore bridge cranes which scoop up 15 to 20 tons in each bucket load and empty a boat in a few hours. The grab-buckets cannot clean up around the sides and edges, so labor gangs go down into the bottoms of the boats and sweep and shovel up the leavings of ore into little piles for removal by special hoists. A crew of women—chiefly Negro—with a woman gang leader has been employed for several months, going from boat to boat as needed. When there are no boats ready for cleaning, they are employed around the docks and stock yards as a part of the general clean-up labor gang. Only the strong and husky woman who does not mind close association with dirt can be placed on such work. Ore, coal, and limestone are heavy to handle even when using a small shovel.

Women were seen in rail receiving yards as car dumpers and car washers working on railroad platforms and trestles. Car dumpers with lever controls release mechanisms which tip cars or drop bottom gates so that the contents can be dumped into hoppers, cars, or chutes for storage or transfer to the stock houses. After the cars are dumped, women climb inside and with shovels push remaining materials through the bottom. In some cases this last job requires an awkward stance on a slanting footing and necessitates the wearing of safety belts. Car washers—women—working from trestle-high platforms wash the cars out with a heavy

. Scheduled
employing women. These were included in report.

force hose. Mixed labor crews of men and women carry on all sorts of general clean-up work around the tracks and yards and women are reported as helping with the repair of road beds, laying tracks, and tamping the earth up around the rails. As transfer-car and dinkey operators, a few women in several mills are moving materials around the yards from stock piles to bins and furnaces. Comparatively few women are found in these sections because in many cases management does not consider the work or conditions fit for women. Generally the jobs in the yards have a slow tempo and in good weather are not too bad, but in cold weather the exposure to all degrees of wind, rain, snow, and low temperatures changes the conditions of the job and also increases the effort required in clean-up work as materials freeze fast to the insides of cars, around the tracks, and on the roadways.

Coke plants.

At most mills there is a marked hesitancy to employ women or even to consider them for employment on jobs around the coke plant. Only 7 of the 41 plants have women workers in the coke-oven section. The deterrents to the employment of women are the same as in the steel processes—that much of the work for which recruits are needed is of a heavy nature, all-round labor, and is accompanied by exposure to heat, dirt, and fumes, and the worst kinds of weather. Laborer is the only job designation on which any sizable number of women are reported, and their work is the usual clean-up. Steel is a dirty business and yard and plant clean-up is never ending. Types of coke ovens vary; some have self-sealing doors on the pusher side and others must be calked around the opening with a special fire-clay mud known as "lute." Where the doors must be luted, a mud car travels from oven to oven and has an elevator mechanism for lifting the worker up and down along the doors. A few women as lutermen and luterman helpers are breaking the jam around the doors, chipping off carbon and old lute between charging operations. They also mix the lute in a basement section below the coke ovens. Lute was reported as made of fire clay, coke dust, ashes, and water. Mixing it and spreading it out to dry is a wet and dirty job.

No women were found as chargers of coke furnaces, as "pushers" on the ramming mechanism that pushes the coke into the quenching cars, nor on the quenching cars. Such jobs are considered too heavy or too hard for women. One plant was contemplating the employment of women on the top of the coke ovens to close the doors after charging, a job accompanied by some exposure to carbon monoxide fumes. Two plants reported having tried women as "wharfman" in the coke plant. The wharfman opens iron gates to release coke that has been dumped from the quenching car through a screening process onto conveyors below that carry it to the blast-furnace stock house. Wharfmen are reported as opening the gate controls hundreds of times in a turn of 8 hours. The women who were tried on the job found it too hard and after a short time either quit or were transferred to lighter work. Another job on which women were reported in the coke plant was that of "apron-conveyor operator," an inspection job of watching pulverized coke as it moves by and sorting out pieces of iron or wood

that may cause difficulty in later processes. These are outside jobs in the coke-oven section and most of them are heavy labor.

Again, in the by-products plants connected with coke ovens the representation of women workers is decidedly limited. The processing and tending of large retorts and stills require training and experience over long periods. Also, the number of jobs and workers needed is relatively small. Occasionally women are found serving as pump attendants and stillman's helpers, watching the gages, taking readings, starting and stopping pumps as directed. Women on platforms level with the tops of tank cars on railroad sidings fill the tanks with by-products. This job is merely one of opening and closing valves and inserting and removing the hose. Another job typical of work assigned to women in the coke and by-products plants is the bagging of sulphates, which is the customary process of filling bags, sewing the tops, and shoving them along on roller conveyors to a railroad car pulled up to the loading dock. A few girls in one mill listed as "efficiency girls" are working on charts and collecting coal and coke samples and serving as test girls. Women are not employed on the primary processes in the by-products section, and the jobs they are doing seem not beyond their strength and endurance.

Blast-furnace division.

No women were seen by Women's Bureau agents on jobs directly concerned with the charging, tending, or tapping of the blast furnaces. Of the women in the industry in the late months of 1943, indications are that less than 5 percent are assigned to the blast-furnace sections and few of these work in close proximity to the actual furnaces. Most of the women are on the clean-up crews, shoveling spilled ore into piles and carting it away in wheelbarrows, and serving as helpers on labor gangs cleaning up around the furnace yard and tracks. Some women as stove-repairman helpers are handing tools and supplies to the workmen, running errands, and assisting with the cleaning out of ashes and soot from the honeycombed flues. The air blasts are cut off and the stoves are cooling, but the work is extremely dirty, sometimes hot, and involves the hazard of stumbling and falling on the rough footing.

Other jobs on which a small number of women are reported in the blast-furnace area are larryman and larryman's helper, panman, filterman, topman, and castings and cinder crane operators.

The larryman operates a small electric car that carries raw materials—ore, limestone, and coke—from the stock house to the skip car. The latter hoists them to the top of the blast furnace. The larry shuttles back and forth in a tunnel-like passageway below the ground level of the furnaces. The operation and dumping of the car are by simple electric controls and not strenuous, but the car vibrates, and in collecting the load of raw materials the operator must handle bin doors in the stock house which, though provided usually with special mechanisms for opening and closing, sometimes stick and require considerable effort to manage them. The larryman's helper closes the bin doors that do not function properly and cleans up around the tracks. In one plant where several women had been tried out as larrymen, the foreman reported that only one of the women had been able to carry on the

work to the full job standards. Drafts, fumes, and dust are definitely present and strenuous struggles with balky doors possible if not probable. The job of larryman does not seem suitable for women.

Women as topman, cleaning off the tops of blast-furnace stoves 50 or more feet above ground, have been reported in only one plant. Twice a day a crew of 6 or 7 women climb to the top of the blast-furnace stoves and for about an hour shovel up the soot and accumulated ore dust. Special one-hour breathing apparatus, a respirator, is provided for protection against toxic gases and fumes. The "topwomen" are equipped with goggles and with hard hats for protection against flying particles and falling objects. Most plants do not consider top cleaning a suitable job for women. The topman is exposed to all types of weather, and working at dizzy heights in wind, sleet, and snow is not a job to be relished by any woman, least of all by those new and inexperienced.

No women are employed on cranes that carry molten metal. In one plant a woman cinder-crane operator tends the controls that scoop cinders from a pile near the blast furnace and dump them into a nearby railroad car, and in another a woman controls the crane that moves and stacks "pigs" in the storage shed.

The job of a filterman reported for women in the blast-furnace area is one of tending water valves and watching gages in a small enclosed room.

In a couple of plants a woman "panman" mixes the fire clay—shoveling the materials into a mixing mill—for sealing the casting hole that seals the blast furnace. The work is carried on in a blast-furnace shed. Mud mixing is not a full-time job and is incidental to other labor.

One husky woman is a most effective blacksmith's helper in a maintenance shop, and in the larger mills where there are separate maintenance shops for the blast furnaces women are bench workers, oilers, and helpers on the machines.

Jobs around a sintering plant are all dirty and chiefly of a labor grade. The sintering plant salvages ore dust and blast-furnace flue dust by mixing it with water and spreading it on moving conveyors that carry it under gas flames for baking into clinkery masses known as sinters, which are charged back to the furnace. Quite a number of women in sintering plants work on dumping the cars of ore and dust, inspecting along the sides of the coveyor to remove lumps of slag and foreign matter, shoveling up spills along the conveyor lines, screening coal and dust, carrying tests to the laboratory, and so forth. All the work is classed as labor. Most of the women are Negro and they are reported as moving as much dirt and materials as men. Everything around a sintering plant is covered with iron dust. Siderosis from exposure to such dust may cause pulmonary difficulties, but the workers seen were not wearing respirators; nor did they wear goggles.

As a whole, the blast furnaces and their immediate surroundings offer little opportunity for the satisfactory utilization of women. Though heavy materials are lifted and moved by mechanical equipment, the controls may be heavy to handle. Unskilled-labor jobs, where the need for manpower is a problem, usually require an employee who can do heavy as well as light

work. Employees working anywhere near the blast furnaces are exposed to heat and to sudden changes in temperature in going from one section to another in the yards and open shed-like buildings; to carbon monoxide fumes; to burn hazards; and with the many semi-dark passageways and smoky interiors, uncertain footings of brick and tamped earth, the possibility of stumbling and falling on tracks, materials, and equipment is always present. Unless there is a critical shortage of male labor, the inexperienced, unhardened woman who comes to the steel mills as a war worker for a temporary period, with little probability of remaining long enough to be eligible for the better jobs, should not be given strenuous or hazardous work. From the practical standpoint, it would seem that the services of women in most of the labor jobs of the area can be of only marginal value because of the heavy nature of the work.

Steel furnaces.

The numbers and proportions of women in the open-hearth, Bessemer-converter, and electric-steelmaking furnaces are small. In 17 mills showing numbers of women by department in the fall of 1943, only 5 percent of the women were employed in the steel-furnace area. About 90 percent of steel is processed by the open-hearth method, which takes the pig iron from the blast furnaces, with scrap iron, alloys, and other ingredients, and cooks them into commercial steel. Most of the open-hearth furnaces are surrounded by a seeming jumble of tracks, broken floors, piles of brick, cars of scrap iron, overhead cranes carrying hundreds of tons of molten metal, charging machines, ingot trains, and smoking locomotives. Whistles and bells are signaling operators to their posts or warning workers to move from the path of approaching objects. One of the chief hazards of working in the open-hearth section is the environment—a worker must be watchful and agile in avoiding moving objects. Women are not employed on jobs hazardous in themselves, but the surroundings are hazardous.

In the open-hearth as in the blast-furnace division, mill officials tend to be careful about the jobs on which women are introduced. Women are not employed as charging operators, melters, tappers, pourers, or helpers on jobs where molten steel is involved. Handling controls that open and close the furnace doors from a position 25 to 30 feet back from the furnace heat is about the closest a woman comes to being a steelmaker. Women like the job of door operator or door puller. Usually women's jobs are largely of a related or an auxiliary service type. As laborers, they do general yard and track clean-up work, unload and stack brick for the use of the bricklayers, unload hot-top rings for ingot molds, hand bricks and balls of clay to masons relining ladles and repairing furnaces. In one instance noted, women were allowed to place the bricks in position on the last few rows of the ladle relining—were actually serving as bricklayer learners and liked it.

Checker-chamber cleaning is one of the hard and disagreeable jobs that women are assigned to. Every two or three weeks the bottoms, the lower levels, of the open-hearth furnace must be rebuilt. The furnace is down and the checker chamber usually has been hosed out before the clean-up crew goes to work tearing

out the bottoms and cleaning the flues. The temperature has dropped thousands of degrees but it may still be from 100 to 120 degrees when the laborers begin working. Men break up the bottoms and women pick up the pieces either by tongs or by hand and load them into wheelbarrows to be pushed out in the yards. The place is dusty, windy, sooty, and may be hot. Some of the bricks weigh 7 pounds or more and about 5,000 bricks may be knocked out in the course of cleaning the checker chamber. The women wear gloves to protect their hands and some of them wear woolen work clothes. Women usually do not work continuously at this job—in some cases three days a week of this and the other three at general labor. Women share in the bonus or incentive rate and like the earnings but not the conditions of work.

Another job of a labor status on which women may work in the open hearth is knocking off the hot top. Special varieties of steel are poured into ingots that have a superstructure of bricks or hot-top rings on the molds. Before this type of mold is stripped from the ingot, the ingot train is pulled past a high platform on which men and women stand and knock off the "hot top," using a long iron bar that rests on the top of a metal-apron heat shield. With one or two sharp blows the hot top is removed. It is a hot job but not a continuous one; it may take less than an hour daily. Women have done as well as men on this job and like it.

As scrapmen women assist with the loading of scrap into the charging cars. Crane operators convey the scrap to the car by magnets. At the proper spot the women signal the operator to release the magnetic force and drop the load into the car. Some of the scrap steel may project over the sides of the charging car and the women climb or work from a platform, pushing the scrap into a compact load. They serve also as hookers, adjusting the hooks for the crane operator to pick up loads of scrap. Women using an oxyacetylene burning torch are employed in the scrap yard to cut scrap into manageable-sized pieces. In the stock yard or ingot shed women act as hookers, placing the cables around the ears of the ingot mold for stripping the ingots.

Many of the jobs for women in the open-hearth division are semiclerical in nature, soft-collar jobs, which entail no physical strain but some of which expose women to the work surroundings of a furnace region. A woman noted by the Women's Bureau agent whose job designation was "ingot shipper" was responsible for ordering the proper ingot molds for dispatch to the pouring platform. She received the orders as to the weights of ingots to be poured and transmitted the instructions to the pourers. It was responsible clerical work that required considerable walking. Test carriers convey small sample pourings to open-hearth laboratories and check carbon content on carbometers. Using spectrographic equipment and pyrometers, sighting instruments for determining heat, women work in close proximity to the furnaces. In some mills women using pyrometers go to the platform where metal is being poured from ladles into the ingot molds and observe the reactions of metal.

Near the Bessemer converter, women observe the color of the flame during the "blow" and signal to the melter when the moment has arrived to stop the blow. The melter also is watching and has

the final responsibility. Women are doing a number of miscellaneous jobs as observers and recorders, clerks keeping tallies of delays, time checkers, tracers of orders and heat numbers, alloy clerks keeping records of alloys dispensed, and weighers working in enclosed cabs, close to the furnace, recording the weights of unfilled and filled ladles. The job last mentioned is hot while the metal is being poured. Except for work on the checker chambers, what is being done by women is not heavy. The tempo of the work is not fast, and compared with most woman-employing industries the women have more leisure than on line-production jobs and there is less monotony. The chief hazard to women in the steel-furnace division is that of the environment.

Rolling mills.

Rolling mills employ more women than the earlier processes of steelmaking. About 2 of every 5 women plant workers are in rolling mills. More women are found in the wire, tin-plate, merchant, bar, and strip mills than in the bloom, billet, rail, structural, slab, and plate mills, the latter group having heavier products. Women are working at hot jobs but most of them are on the later cold processes and on the auxiliary jobs of inspection, checking, observing, tool-room attending, crane operating and hooking, and clean-up. The majority of the women in the rolling mills, as elsewhere, are classed as laborers, with plant-housekeeping and "helpers" duties.

The bloom, billet, and slab mills are the rough basic rolling mills. Ingots, usually hot from the steel furnaces, are carried by heavy cranes (men operators) to large pits where they are soaked in heat to temperatures of over 2000° F. Women are being employed as cover operators to open and close the doors of the soaking pits. The levers that control the doors are handled either on a shuttle-like carriage that travels the length of the pits or from elevated platforms on the sides. The worker is exposed to radiant heat but it is not a direct or especially intense heat. No women are reported as heater helpers, bottom makers, croppers, butt pullers, rollers, or manipulators. Rollers and manipulators are craftsmen with years of experience in steelmaking and women could not qualify for these jobs. Cropping off the butt end of the ingot before it goes into the rolls and pulling off the butts with heavy tongs into the scrap chutes are heavy and very hot jobs, decidedly unsuitable for women. Marking hot blooms, billets, and slabs with a blow from a hammer that has a die sunk in its head is hot and strenuous, but a woman was reported as working on this job. A few women scalers were throwing salt on hot slabs, a noisy and dangerous job because of the hazard of flying sparks and scale, and a few women were quenching the heat of slabs and washing off the scale with an ordinary water hose. In one plant a woman on each turn stands on a platform near the slab-heating furnace and sweeps scale off before the slabs are pushed into the furnace. Women observers, recorders, heat chasers, while not doing any work of a strenuous nature, are exposed to heat and the general hazards of the room. One woman observer was indicating to the crane operator the pits from which ingots were to be withdrawn for rolling after checking the heat with an optical heat-checking device.

In the conditioning of billets, blooms, and slabs in the storage yards or docks, a relatively small number of women compared to men are scarfers, grinders, and billeteer operators on conditioning jobs. Snags and surface imperfections on blooms, billets, and slabs are removed by chipping, grinding, and scarfing. No women were found on chipping at the time of the survey, though some plants had tried women. Chipping with pneumatic tools on steel is too heavy a job for women, who are not able to stand the vibration. Women are using portable hand grinders and fixed swing grinders—the latter sometimes known as Mexican grinders. Most of the work with grinders is heavy and requires arm pressure and other muscular strains. Where the work assignment requires continuous application of grinders, it has proved too heavy for women.

In some mills women mark surface defects part of the time as a change from grinding. In one plant where women had been tried on swing grinders the management took them off after a short try-out as the women could not stand the back and arm strain. Scarfing, burning away defects with an oxyacetylene torch, is done occasionally by women. Scarfing is not such heavy work as grinding but there is danger of burns and the fumes from the burning metal are a gastric irritant. Sparks cascade from both grinders and burning torches, but the burning hazard is considerably less from the first. On scarfing women wear protective clothing similar to that worn by welders. Turning the billets, blooms, and slabs even with mechanical aids is heavy work and women require extra labor assistance. If this is not available the work is too strenuous. The women like the scarfers' and grinders' earnings, but for most of them the job is too arduous and demanding physically. Billeteer machines that gouge the surface with revolving chisel-like tools are tended by women in a few plants. The work is placed by hoists and the tending does not seem strenuous.

The utilization of women, being still in the try-out stage, varies markedly from plant to plant and within the mills in the same plant. Women are shifted around from day to day over a wide area, so in some instances it is difficult to get a clear idea of the full extent to which women are employed, the hazards, and the special job arrangements made for them. Crane operating, crane following and hooking, checking, marking and painting identifications on all kinds of steel, inspecting, and weighing are jobs common to all types of rolling mills. Usually only the lighter cranes—10- or 15-ton types—are handled by women and they are not over hot furnaces. Some of the older cranes have controls that are difficult to manipulate, but the new cranes are all suitable for women, who have been found to be as good crane operators as the men. As chainmen, hookers, and crane followers, women follow the cranes, wrap chains around the ends of steel products or attach the hooks and signal the operator for the lifting or release of the load. Usually this job is suitable for women, but it is not desirable if the hooker is required to lift, turn, or push the products to attach the chains or hooks. Instances were reported where women hookers have been unable to do the job because the heaviness of the work required too much extra assistance for effective woman utilization.

Women checkers and recorders keep tallies of the sizes, process and heat numbers, and weights, check shipping orders, and do floor clerical work. Women loaders are really checkers, checking shipping invoices and counting pieces. Sometimes the loader signals the crane operator, but the loader's work does not involve any physical strain.

Painting the end of billets, bars, marking blooms, slabs, plates and other products with identifying marks is a paint-brush or crayon job and is done as well by women as by men. In an armor-plate mill women were stepping out on a hot plate as it came along on the cooling bed, inspecting it, and marking defects and identification. The women wore heavy wood-soled shoes, as the plate was still hot.

Women hot-bed operators were not common. The hot-bed operator sits in a raised pulpit above or at one side of the cooling beds and operates levers to move bars and strips of steel to the proper tracks on the conveyor. The job can be done by women and occasionally is, but the tendency is to reserve such jobs for older men who have long service records and are no longer able to do strenuous work. A similar controlman's job is tending the "screws" in bar mills and is sometimes done by women. The screwman regulates the distance between rolls.

In the merchant and bar mills, some women are tending the shears or saws that cut bars into prescribed lengths and more are working as helpers, raking the hot bars down into cradles, banding them with wire or narrow metal strip, attaching the chains and signaling the crane operator to remove them.

Women were operating straightening machines for flat-surface bars, but the straightening of rods or rounds where a rotary straightener is used is too strenuous and hazardous for them, as the round bars whip around at the feeding end and there is marked vibration as well as a decided danger of being struck by the bar.

Some bars are finished by turning in a centerless grinding machine, and these are tended by women satisfactorily. Visually inspecting the bars by rolling them along on skids is another job quite often assigned to women in merchant and bar mills. Merchant mills make thousands of steel products to buyers' specifications and the work varies in type and heaviness.

In one of the strip mills visited, one-fourth of the workers in the finishing department were women. Besides the usual auxiliary jobs, small numbers of women operate the levers of the speed regulator controlling the movement of the strip through some of the rolling mechanism. It is a pulpit job, watching dials and pulling levers. In one mill a woman looper operator was working along in the same pulpit with the speed regulator handling the levers that retard the speed of a length of strip by throwing the strips in slight arcs when a momentary slow-down is needed to synchronize movement of strip in the rolls. A few women serve as shear and slitter operators, but as yet women are chiefly helpers on these jobs. On leveling machines, women are operators' helpers and catchers of the small-size sheets. As scrapmen, women collect scrap, cut it with burning torches and shears, and bale and tag it for furnace charging. In the pickling, the branning, and the bonderizing sections, women are used as helpers and sometimes as

operators at machines such as those feeding sheets into the scrubbers, wiping and piling them as they come out of baths and off machines. Hot coils of strip and hoop steel are banded, marked, and tagged by women directly as they are dispatched from the coiling machine and still very hot. The work is not heavy but there is danger of burns and the heat is intense when exposed to several coils. Frequent spells are a necessity, and in one mill where the workers (men and women) had worked 15 minutes and spelled 15 minutes, the periods had been changed to 40 minutes of work and 20 minutes of spell time, which the men felt was insufficient for themselves and especially so for the women. The largest number of women on any job in the light plate, strip, and sheet mills are still the assorters in the tin-plate mill.

In the rolling of heavy plate, considerably more than half the women were laborers. Other women were grinding, scarfing, shot blasting, and cutting plate with oxyacetylene torches, and piling plate. Weighers read scales and record weights. The weigher's job sometimes requires ability to use a slide rule and when many grades of steel are coming through is complicated.

In mills specializing on manufacturing tubular products, tubes, pipes, and cylinders of many kinds, some of the direct production jobs that women are filling are cutting or sawing lengths of pipe, blowing the scale from the inside, distributing pipes or tubes to designated furnaces by platform controls, straightening, threading, marking, and testing the pipes.

In the wire mills where coiled rods are drawn through a succession of dies, annealed, spun, twisted, braided, and woven into a great variety of products, women are employed on some of the direct production processes of drawing, cutting, spooling, welding, and fabrication on the finer and lighter wires.

Possibilities of effective utilization of women workers in the rolling mills seem more auspicious than in the earlier steelmaking processes. Exposure to extreme heat is a deterrent to the use of women on some of the jobs near reheating and annealing furnaces, and special efforts to safeguard inexperienced women workers must be observed, as must sufficient rest periods. Heavy lifting does not seem to be an acute problem as the products are handled by mechanical devices.

In all the rolling mills there are many opportunities for the employment of women in clerical work, weighing, shipping, inspecting, tool-crib and storeroom tending, plant maintenance and protection, and laboratory testing, which are much the same in steel as in other industries.

Fabrication.

In addition to such basic rolled products as billets, plates, rails, structural steel, rods, bars, tubes, and wire, many of the rolling mills are carrying on further fabrication in their foundries, forges, press, machining, and finishing departments on normal products. Examples of these are wheels, structural parts, nails, spikes, bolts, nuts, and woven-wire products. During the present war period these plants have been working also on disks for ammunition, heavy projectiles, gun forgings, propeller shafts, landing mats, torpedo nets, and other items for the combat services. The war

products generally were new, the possibilities of employing and placing women were explored earlier than in the basic steel processes, and the proportion of women employed is greater than in the older departments; in some, one-fourth to one-third of the employees are women.

Jobs that in many cases had been filled by boys in the nail and spike mills, such as operating tumblers polishing and cleaning nails, packing them in kegs, threading bolts and screws, tapping nuts, forming the heads of nails and spikes on upsetting machines, operating tractors and lift trucks, inspecting, making kegs and boxes for shipping, weighing, and loading cars, are employing women, though in normal times these jobs were not considered desirable for women because many of them involve the handling of heavy materials and the operating of machines not customarily assigned to women. Additional labor service is provided on some jobs and in many cases conveyors and hoists have been installed. Foremen and management representatives are almost unanimous in reporting that the ability and output of women in replacing men have been satisfactory.

On the munitions products of many kinds that are being manufactured by the steel mills, women are found in the forge, heat-treatment, foundry, machining, and final assembly and finishing departments. In the machine shops and assembly departments women's work is similar to that in shops not connected with steel mills doing heavy metal fabrication. Women are operating all types of machine tools, drills, and boring machines, lathes, milling machines, grinding machines, punch presses, saws, and special-duty machines. The work is heavier and usually slower in its timing, since in much of the work heavy hoists and hand cranes are used by both men and women in setting up the work. In some places set-up men serve both men and women; in others, women often set up the machines. Women are working with the men on lay-out work, following blueprints, and on templates, using scribing tools and center punches. In an armor-plate mill where parts are fabricated for combat vehicles, women are doing the major part of the lay-out, are doing most of the cutting of contour parts with single-torched oxyacetylene burners, and are cutting long straight parts with gang or multiple fixed-position burners. The work is not heavy but requires skill in directing the burners along contour lines. There is an ever present hazard of burns and glare from the torches. The women wear goggles, have leggings or spats, a work garment with a high buttoned shirt, and sleeve protectors; their hair is covered with both a cap and a scarf to restrain any locks that may be a fire hazard. Beveling and conditioning the edges of cut surfaces also is done with torches.

In the heat-treat departments visited, women are working as preheater-furnace attendants, charging and tending special rotary furnaces for shells, dipping shells in molten-lead pots, and starting and controlling heats and timing the large furnaces and annealing ovens in which propellers, gun barrels, and armor-plate parts are being conditioned. Heater helpers keep records of cold materials going into furnace, heat time, and temperatures. Tending furnaces is hot work, but the periods during which the worker is exposed to high degrees of heat are short and fully as much or more time is

spent in watching gages and controls in booths apart from the furnaces. None of the work of the women furnace attendants is strenuous from the standpoint of weight handled.

Women are doing inspection, quality-control checking, and observing and recording furnace temperatures with sighting instruments such as the pyrometer. They are found also on the usual incidental jobs of cleaning-up, crane operating and following, tractor and lift-truck operating, and painting with spray guns and brushes.

Quality-control and laboratory workers.

In the research, metallurgical, and chemical laboratories of the steel plants, there are many jobs of a professional, routine, clerical, and manual nature that can be filled as well by women as by men. In some of the mills the laboratories were the first department to induct women workers. In a few the numbers of women employed exceed those of men.

The number of women who are professional chemists and metallurgists doing research and analyzing steel is small, and the number of jobs of this type, too, is limited. Most of the testing is routine and repetitive work that requires little scientific background on the part of the employee but does require ability to follow instructions and careful laboratory techniques. Testing processes have been broken down. Women are found to be at least as good and often better than men in following detailed procedures under supervision. The praise of women as laboratory aides in steel is spontaneous and unsolicited.

Preparing tests of steel for microscopic inspection and testing involves machining, and women are operating various kinds of machine tools—drills, lathes, grinders; using polishing wheels, saws; and doing such hand bench operations as etching, burring, and grinding. Some of the tests are heavy—weighing from 50 to 80 pounds—but most are small and can easily be handled by women. One mill at least had a new installation of roller conveyors in its laboratory so as to expedite the work of the women test preparers.

Routine hardness testing on all types of devices such as the Rockwell, Brinnell, and Scleroscope is a common job for women. Carbon content for some testing is checked by women using the carbometer. Women tend miniature heat-treat furnaces. Spark testers observing the color of sparks on test operations determine the properties of tubes being cut. Records of tests, of course, must be precise and detailed, so laboratory workers generally are selected from women with at least a background of a high-school education if not more formal training.

Women laboratory aides not only work in the central laboratories, but in the large plants are found in specialized laboratories in the coke-oven, blast-furnace, open-hearth, and rolling-mill areas.

Beginners in the laboratory often start as test carriers or messengers between the operating location and the testing divisions. On this job the messenger may be exposed to all the hazards of the areas to which the work carries her.

In some plants all laboratory work and most of the inspection stem from a centralized quality-control department. With such organization, observers, pyrometer readers, and inspectors in the basic mills all report back to a central office. Few women as yet know enough about steel processing to take over much of the highly technical work, but the utilization of women in this type of job has already made strides and it would seem to be one of the places where there is a definite post-war possibility of employing women.

Maintenance shops and miscellaneous services.

Women are workers in the maintenance shops of most of the plants. The large mills where there is greater feasibility of job specialization and break-down have a greater proportion of women, as the lighter jobs not requiring an experienced mechanic can be assigned to them. The electrical repair shop in steel mills has been considered one of the most satisfactory and effective spots to employ women. They repair and wind armatures, tape wires, dip coils in insulating varnishes and bake them in ovens, clean and inspect bearings and brushes, and do assembly, inspection, and miscellaneous bench-work jobs. One woman was seen splicing cables. Even in the electrical shop, work that would be suitable for women in a light industry is out of the question because of the size and weight of the heavy-duty equipment used in the steel industry. Then too, in all maintenance shops the possibilities of having line-production methods, conveyors, hoists, and so forth are limited because of the variety of work.

In blacksmith and boiler shops, a few women are helpers tending hammers, following the blacksmith's signals, welding, being "stick-in" men setting hot rivets into holes for the riveter, and doing lay-out and fabrication of sheet metal. The making, pasting, and cleaning of cores and the acting as molders' helpers are new women's jobs in foundries of the steel industry.

Women machine operators on lathes, drill presses, milling machines, shapers, grinders, and saws, and bench jobs cleaning and burring small parts, are found to a limited extent in the machine shops. Much of the machine-maintenance work is on very heavy equipment requiring the use of large machines and tools in handling and setting up, and, as in the electrical shop, the possibilities of employing women are limited by the nature of the job. Grinding, polishing, and lapping tools and dies are tasks that have proved very satisfactory for women.

Women are helpers in the shops where rolls are repaired for rolling mills.

Cleaning chips and scraps out of machine pits—a shoveling job that is dirty and greasy; housekeeping and general clean-up; tending tool cribs and storerooms; operating tractors and cranes; running errands and carrying messages, are among the incidental jobs held by women in the maintenance shops.

In the matter of skill the women in the maintenance shops vary from the unskilled clean-up worker to machine operators who are carefully following lay-outs and blueprints, doing their own set-up and diversified work on lathes. Giving preference for shop women to those who have had vocational training in machine-shop techniques and standards was reported in several cases.

Blast-furnace gas is frequently used for driving turbines for electric power and generating steam, and the power plant is likely to be close to the blast-furnace area. Where a blast furnace is not a part of the plant, the power plant is like that of any heavy industry. About one-fourth of the mills had women in their power plants and in at least one the women were one-third or more of the oilers and greasers. The oiler wipes the machinery, turns down grease cups, and crawls around watching turbines and engines while they are in motion. Women clean the flues of boilers with compressed air hose. Where blast-furnace gas is used, a leak in an intake pipe lets loose the hazard of carbon-monoxide poisoning. The plants train workers in gas prevention and rescue techniques, and generally the rules require that employees so arrange their work as to be at all times within close call and eye reach of a fellow worker for aid and quick action in case of gas leaks. Clerical engineering aides, recorders, air-compressor operators, water-softener helpers, and power-station tenders are other jobs in the power area reported for women. The work of the women in the power plants is light, requires considerable intelligence, and seems suitable for the few women that it is possible to employ.

Bricks are continuously on the move in a steel plant. Hundreds of kinds of brick, varying in size and refractory characteristics, are used to repair and rebuild furnaces, checker chambers, soaking pits, and coke ovens and in general maintenance. The handling of bricks as stores or supplies is a labor job and is one to which a good many women have been assigned. Women unload the incoming bricks in sheds or yards, stacking them by size and type. Weights of the individual bricks vary from a pound or two to more than ten pounds. Roller conveyors, tow and lift trucks, are used to push them around and the tempo of the work is not speeded, so there appears to be no marked physical strain for women of average strength. The women fill orders, loading according to specifications on trucks or railroad cars, and sometimes following on foot or by truck to deliver and unload the bricks in piles at their destination. Women are reported as liking very much to be on the loading and delivery gang, as the work has variety and takes them around the plant area. In one plant a woman group leader in masonry was enthusiastic about her job and her knowledge of the many kinds of brick and stacking techniques. In the steelmaking and other areas women distribute the bricks in small piles near the spot where needed, and often hand the bricks one by one to the bricklayer as his helper.

The yards of a steel mill are a meshwork of tracks, high lines, and roads for receiving goods, moving materials and products around the area, and shipping. Women laborers act as part of the road gang on highways, cleaning, oiling, and spreading crushed rock for highway repairs. They work also as cleaners-up on the tracks and helpers on track repair. Women drive trucks and serve as chauffeurs for company cars in and outside of the area, for the plant transportation and delivery system. Women brakemen and switchmen are not common, but several plants are using them and the women are riding on the fronts of the engines throwing the switches and coupling and uncoupling cars according

to the orders of the crew chief. A few women are working in the railroad repair shops attached to the mills, and are doing work similar to that of women in the shops of the regular carriers. Throwing switches and setting brakes are dangerous jobs, requiring individuals who are agile and sure-footed. Women probably are less sure-footed than men and more prone to falls. In general, most of the jobs in the yard and transportation services are heavy, subject the women to the specialized hazards of the areas, and can hardly be recommended as suitable for women.

Some plants have women gardeners caring for the administrative building lawns, flowers, and shrubbery.

About one-fourth of the plants have women as guards, most of them armed and serving as military auxiliary police on gate and patrol duty. The women receive the same training as men in handling firearms and usually have proved better than men in hitting the target. Women guards are no longer unusual in war plants.

Women have been stenographers, typists, and record and general clerks in the administrative offices of the steel plants for many years, but inside the gates of the mill yards few women were employed before the war. The induction of women into factory or plant clerical work has been more marked than their induction into production and service jobs. Women are now employed as production record, stores, billing, accounting, timekeeping, personnel, and general plant clerks. Observers and recorders in the mill are doing clerical work that takes them away from desks and the usual office environment. Messengers in many cases are girls. Women have been able to familiarize themselves with steel terminology and records with much less difficulty than management anticipated. In some plants the number of women on plant clerical work exceeds that on industrial jobs.

Conclusion.

Women are now working in most divisions of the steel industry but their proportion is small, about 8 percent. The need for new workers is at the labor level and most of the women are recruited at this classification. Some of the jobs that would seem most appropriate for women are closed to them because of the seniority system. In the basic processes of the blast furnaces and steel works, most of the jobs other than those of a labor classification expose the worker to high temperatures and other strains inherent in a heavy industry. The possibilities of employing any significant proportion of women in the preliminary processes seem slight.

More women are employed in the rolling mills and fabrication departments, but these too have more heavy jobs than light ones. The work in the laboratory and quality-control sections appears especially suitable for women, and this would seem to be a place where a large proportion of the force could be women in normal as well as in war times.

Women are not able to work where marked spurts of strength and energy are necessary at times. Most of the women are employed on the labor gangs or the auxiliary jobs, such as crane operator, crane follower, laboratory aide, inspector, controlman and pumpman tending levers and valves, and as general helpers

in the maintenance divisions. Management does not anticipate that women will form any large proportion of the steel-mill workers, but more can be employed. To secure effective employment of women—most of whom are inexperienced—management has given and must continue to give consideration to the lesser strength, the lack of industrial experience and familiarity with heavy industry, and the short-time viewpoint of women's employment in the industry. It appears to be generally agreed that women's employment in steel is a temporary war expediency and that men returning from the armed services will have seniority and priority on the jobs in the industry after the war, so it seems hardly fair to ask women to do extremely heavy labor and dangerous jobs and dissipate their strength on employment that is of a temporary nature.

HOURS, RATES, WORKING CONDITIONS, AND PERSONNEL RELATIONS

Working hours.

The basic hour schedule of the steel industry is an 8-hour day and a 48-hour week. Until the summer of 1943, the 5-day 40-hour week had prevailed. The shift to the longer week had been made in all departments engaged on war products, but due to the curtailment of civilian products rolled in the merchant mills, some of the latter were still on a 40-hour week.

Blast and steel furnaces are continuous processes, usually stopping only when the furnace is down for rebuilding or for repairs. Workers customarily have one day in seven off. Only one mill reported a 7-day week as a regular schedule for women; this was in its tin mill. Another mill had occasional 7-day weeks for women workers. Overtime beyond the 8 hours daily was rare for women. Even for men the overtime demands have not been marked. Curtailment of Government orders had temporarily reduced the hours of some departments to less than 48 for at least part of the workers.

The traditional plan of rotating shifts or changing turns in the steel industry is weekly. On continuous processes the weekly shifting has become an institution, and though some of the company and union officials feel that a longer period between changes might be advisable for the health of the workers, the general consensus seems to be that any change in the period of rotation would not be desired by the workers, since the men have become accustomed to the practice. Approximately 20 to 25 percent of the employees work on the day shift continuously—on maintenance and service jobs largely—while the rest are on shifts that rotate weekly. Women with home responsibilities and child-care problems find the adjustment of their work and outside-of-work schedules harder than that of men, and the difficulties are apt to be a contributing factor in absenteeism and turn-over. Some of the mills have recognized this condition and have tended to assign women to day-shift jobs to a much greater extent than men.

Lunch and rest periods.

In the steel mills—especially in the furnace and rolling-mill divisions—the traditional and customary practice is for men to

eat their lunch and take their rest periods in "spells" from their work. On a hot and heavy job, men are scheduled to work for a definite time and then have a specified period off that is known as a "spell." A worker may have a cycle of 40 minutes of work and 20 minutes of spell time. On some strenuous jobs the spell time may be as long as the work time. As a result, there has been little in the way of regular lunch periods in the steel industry. To a visitor in the steel mills the lunch period appears to be continuous. Coffee is always being made on hot billets, slabs, and plates of steel, and men on spell time are always to be seen having a snack from their lunch pail, or a cigarette, with a large cup of coffee as a bracer. Lunch counters are used primarily as a source of food to be carried back to the workplace for spell periods.

The advent of women in the steel mills brought to the fore the problem of a definite lunch period for them, especially in States that have statutory regulations covering women's lunch periods. Such statutory regulations in States where steel mills were visited in the Women's Bureau survey are as follows:

New York—60 minutes but may be relaxed.
Indiana—60 minutes but shorter time may be permitted.
Maryland—30 minutes after 6 hours.
Ohio—30 minutes after 6 hours during war.
Pennsylvania—30 minutes after 5 hours except in continuous-operation manufacturing processes; may be suspended during war.
Colorado—No regulation.
Illinois—No regulation.
West Virginia—No regulation.

Most of the steel mills have a policy of a half-hour lunch pause for women, and they have provided tables and chairs and in some cases electric plates in the women's rest rooms. Actually, however, on continuous processes women tend to follow the men's routine, taking their lunch and rest periods as spells allow, and often the women's lunch periods are on the job and as indefinite as those of the men.

Where lunch periods have not been formally designated in the steel mills, the usual practice is to pay for the over-all work period. A few mills in Pennsylvania, Ohio, and Maryland, claiming that since the law requires definite lunch pauses for women a deduction of a half-hour must be made from their work time, give the men 8 hours' pay and the women 7½ hours' pay. While it is not the practice in most industries to pay for lunch periods, in an industry where men are paid for their spell time it seems unfair to pick women out for different treatment. On day shifts where the over-all hours are not limited to 8 by rotation practices, an 8½ hour spread of work time with a half-hour lunch period is customary. Some of the mills, of course, treat women as men and pay them on the same basis for their lunch period.

Spell periods are rest periods in steel, and though in most of the mills it is not usual to set aside definite and formally designated rest periods for women, allowances of 10 or 15 minutes in the first and the second half of the shift are made for rest and refreshment.

Rates of pay—Equal pay.

A highly virtuous feeling seems to imbue managers when they pay the same rates to women as to men on the same, similar, or comparable work. They report with pride that women are treated the same as men, or that they have agreed with the union that women shall receive men's rates of pay when they replace them. All the steel mills visited have accepted the equal-pay policy—at least in part. On all regular jobs the rate has been set by the job, and as soon as a worker qualifies on seniority and merit he is paid the established rate. When women have replaced men as laborers or on jobs carrying a low degree of seniority for which they can qualify, they have almost universally received the same rates as men. Organized labor has insisted that women shall not compete unfairly with men by taking their jobs at lower prices. On jobs that traditionally have been women's, however, such as the assorters in the tin-plate mills, the beginning rate sometimes is below the established minimum for inexperienced men. In some plants the women beginning at these jobs are paid 62½ and 63 cents, while if they began on a man's job in the same plant their rate would be 78 cents. The beginning rate for the women assorters largely reflects the general attitude toward women's wages.

In a few instances it is claimed that women are not performing the full job as formerly done by men, and that for this reason a slight differential in the rate paid is justified. In some such cases the difference in the duties is questionable. In one plant visited the hourly rate for women crane operators is 11 cents less than that for men because women are not supposed to oil or make repairs on the cranes they operate. Inquiry by Women's Bureau agents revealed, however, that it is not customary for men either to oil or to repair cranes, as regular maintenance crews take care of this servicing. In the same plant, since the State law requires that women be allowed a half-hour for a lunch period, this time is deducted and the women are paid for 7½ hours while the men are paid for 8. The men are not allowed a specified period for lunch but have "spells" during which they eat their lunch, and this time is reported as about half an hour. The woman crane-operator's lunch period is regarded as one of her "spells," and actually she usually has no more time off than the man operator.

On some of the new war work of a fabrication nature on ammunition components, learners' rates have been established for jobs held by women, with periods of several months' progression before they reach the minimum rate at which men start on laboring jobs. Men also must be trained on the job, but there are no similar learners' rates below the basic minimum for them. Further, for women clerical workers the traditionally lower rates paid women are reflected frequently in the wage policies, and as these workers ordinarily are not covered by collective-bargaining agreements, women who replace men do not always receive the same basic pay. In general, however, for most of the plant workers the equal-pay policy is practiced on jobs held by women.

Rates paid to women plant workers.

The lowest starting rate paid to a woman plant worker in the steel mills covered in the survey was 62½ cents an hour; women

on plant clerical work, however, had starting rates of 50½ cents on jobs formerly held by men at much higher rates. The highest starting rate paid to a woman was 84½ cents—the minimum both for men and for women in some plants. A large majority of the plants had a beginning rate of 78 cents, which is the lowest rate recognized in most of the union contracts for basic steel. Since most of the women have been employed in the steel industry for only a short time, it is not surprising that the usual starting rate and the prevailing rate are the same, 78 cents. In some of the mills the 78-cent minimum applies only to workers who do not rotate on shifts. Turn laborers who rotate weekly receive 79½ cents, but otherwise there are no differentials for night work. The range of women's wages is limited and very few have reached jobs with hourly rates of more than 90 cents.

Automatic wage increases are not customary. Seniority rights of workers are recognized in most of the steel mills. Progression and upgrading are dependent on seniority combined with merit. Since the tenure of women in steel is short and since the women are regarded as temporary substitutes, upgrading has been limited. Seniority regulations sometimes bar women from certain of the lighter jobs. It has been customary for many years for men to begin in the steel mills as laborers and advance with experience to better-paid and usually less strenuous jobs. Some of these jobs are better suited to women than others on which they are employed, but men who have served their turn at heavy labor, and probably now beyond draft age, rightly have a claim to such jobs. When vacancies occur above the labor level, seniority is a factor, and while the unions recognize the seniority of women they do not want to give them special privileges. A small number of women are now securing some seniority and will be eligible for promotion. All workers who have been taken on as replacements of men in the armed services and for increased production have been employed for the emergency period, and they are not expected to attain seniority that will give them precedence over steelmen in the service.

A large proportion of the jobs in this industry have tonnage or other incentive basis of payment. Group work and group bonuses are more usual than individual piece work or task systems. Actual earnings of many of the men are increased materially by the bonus payments but the proportion of women who have been assigned to work that carries bonus rates is small. In some plants all the women are on a time basis.

Occupational rates.

Multitudinous job rates are characteristic of steel mills. Several of the steel personnel men estimated that their companies had thousands of job rates, which had been established by negotiation between management and labor. Rates for jobs covered by the same terminology vary not only among departments but within a department. Most of the women, however, are on beginning jobs rated in the lower brackets of skill that concentrate at the under-80-cent levels, with relatively few women on rates of 90 cents and more. The lowest rates for women who were industrial workers—62½ and 63 cents—were for beginning assorters in some of the

tin-plate mills. This has long been a woman's job and the rates reflect the traditional attitude of evaluating women's jobs on a lower plane. Some of the tin-mill assorters, however, start at 78 cents, the most common rate for women.

This survey of women in steelmaking did not include the copying of pay rolls and job classification by individuals. Instead, the job rates were secured from personnel and other company officials. In the appendix of this report is a list of hourly rates paid women at time of survey. It is not exhaustive but is indicative of the typical rates being paid to women in the principal plant divisions in the eastern and midwestern steel plants. Most women were on the lowest-priced jobs.

Rates for office workers.

Clerical workers in the plants often are paid less than the industrial operatives. Few women were employed in the steel plant offices before the present war, and when women replace men the tendency is to assign rates comparable to those paid women in the administrative offices and not on a par with those formerly paid to men. Women with clerical experience were reported as being taken on at $90 a month to carry jobs in plant offices for which men had received $150 and $160. Clerical workers have not always been included in union negotiations. Even with overtime payment for hours over 40 a week, many of the women on a monthly basis were earning less than $125 a month on office work.

Labor supply.

Steel is a basic raw-materials industry for both civilian and war goods and its expansion has been largely in the increased use of existing facilities and staff. Weekly hours had been 40 or less until the spring and summer of 1943. Steel communities tend to be made up of steelworkers' families who have been rooted in steel for more than a generation. Many of the retired workers came back when labor was needed. In some of the steel communities Negroes were recruited or came of their own volition to work as laborers in the mills. The manpower problem was not generally so acute as in the newer war industries, even in areas where other industries were experiencing an acute shortage of workers. When it became necessary to recruit women, the local supply, with a steel background, has proved adequate. Wives and daughters of steel families have been given preference and also were the first to apply. Most of the women employed in the steel mills have not come from other manufacturing plants but are housewives or former workers in the service industries. None of the mills report any difficulty in recruiting women. Some of them say that they have only to make it known round the mill that additional women are being considered for employment, to have more women apply than are needed.

Employment policies.

Age.

The usual minimum hiring age for women in the production area of steel mills is 18, but in two mills no women under 21 are employed, and in one mill girls of 16 are taken on. Girls 16 to 18 are employed as messengers and office workers in some of the

administrative offices, but are not allowed to go into the plants. In most of the mills some boys of 16 to 18 are working. While women under 40 are preferred, as stronger and more agile for heavy work, there is no fixed maximum age. Occasionally a grandmother on a production job is pointed out, but women in their 50's and 60's are few. Usually they are janitresses.

Marital status.

Most of the steel mills are not concerned with the marital status of their women employees. One mill is reported as not hiring married women except the wives of steelmen in the armed services; others give preference to such women but beyond that are not concerned with marital status.

There is no general policy with reference to the employment of women with young dependent children. Most mills accept them. Usually inquiries are made as to provision for the care of the children in the mother's absence, and women whose plans seem inadequate are not employed. Two of the mills investigate to make sure that the provision for child care is satisfactory, and one makes special investigation when the interviewer feels that the plans of the mother are inadequate or questionable. Another mill does not hire any woman with a child under 12 months. Little interest was expressed in child-care centers, primarily because the hours of the steel industry with rotating shifts do not fit in with the hours during which child care can be obtained at a nursery. The proportion of women in the industry is too small for much concern along these lines.

The same is true of policies and practices in regard to handling cases of pregnant women; few plants have formulated a definite policy and most plants handle each case individually. In one mill—the one with the most definite plan—any woman reported as pregnant is interviewed by the company doctor and the period of time she is permitted to remain is determined from this interview plus a statement as to her condition from her physician. A woman worker who left because of pregnancy may be reinstated from 2 to 6 months after the birth of her child if she furnishes a statement from her own physician that she is fit for work and passes a check by the company's doctor.

Negro women workers.

Negro women are employed in most of the steel mills. The majority, like the white women, are working at labor jobs. The proportion of Negro women in the masonry and outside-labor gangs is large. Where women are employed in the sintering plants, they are chiefly Negroes.

Work clothing.

Women working on heavy jobs in the steel mills usually are dressed suitably for their jobs. The necessity for suitable clothing soon becomes apparent to women as well as men even if management does not set the standards. Women working in the yards, the stock houses, furnaces, and many of the rolling mills soon discover that they need sensible shoes, heavy slacks or overalls, a working man's shirt, and a visored cap or turban that covers the hair and keeps the dirt out. Except in the tin-plate sorting rooms,

laboratories, and plant-office jobs, trim garments in pastel colors have little place. In tin-mill assorting, where light-colored uniforms are reported, the girls constantly see their reflections, and perhaps uniformity and trimness aid production.

Many women wear men's work garments and boys' ankle-high shoes, and as one approaches a labor gang on the trestles, in the yards, in the blast-furnace area, the sex of the workers cannot be determined by the clothing worn. They all look pretty much alike. During cold weather the women have found wool trousers, long underwear, and extra sweat shirts or woolen shirts as necessary and desirable for them as for the men. Uniformity in the sense of special "wow" suits is not characteristic of the steel industry. Personnel and safety officers determine standards for suitable and safe clothing. Safety has been actively promoted by the steel industry for many years and safe clothing in a steel mill may be not only insurance against maiming and disfigurement but a matter of life and death. Wherever special accessories are required, such as hard hats for protection against falling objects, asbestos leggings, protective jackets, helmets and shields for oxyacetylene burning, scarfing, or welding, they are supplied by the company. Workers usually provide their own gloves.

Head covering in the steel mills is needed not so much for protection from whirling machinery as from dirt, sparks, and burns. Many women wear men's visored caps. Turbans or closely woven caps are preferred to keep out dirt. In the assorting of tin plate and in some of the other jobs there is no apparent need of caps. Wherever there is a hazard of burns from sparks or hot metal, compliance with or enforcement of safety-headgear standards is good.

High shoes are more satisfactory than low shoes for heavy work of a manual-labor nature, as they afford more support and protection against dirt and injuries. In several mills comments were made by safety representatives that women of their own volition had adopted the wearing of boys' or men's high-cut safety shoes because they found them to be better wearing, more comfortable, and more satisfactory than the women's safety shoes. Men have been urged to wear safety shoes in the steel industry for many years and the same policy has been followed with women, but it has been difficult to secure satisfactory women's work shoes of a safety type, and women in most mills have been allowed to wear any shoe that apparently was suitable. A steel mill with its dirt, its tracks, uneven floors, and brick footing does not tend to the wearing of light, high-heeled, and open footwear. In one of the mills visited, whenever a shipment of either men's or women's desirable safety shoes was received, a truck with the shoes and a fitter made the rounds of departments offering its stock.

Job training.

War production, with the hordes of new workers in the last two years, has focused a great deal of attention on training. Most plants are now training-conscious. All but a very few of the steel plants have training classes of some sort for foremen and key personnel to teach them to instruct on the job and to supervise the workers assigned to their departments. A few women who

are to be instructors or group leaders are trickling into these courses, but most of the training is done by men. The various courses and methods that have been developed by the Training-Within-Industry Service of the War Manpower Commission are the basic primers for developing job instructors.

In the home office of one of the companies a central training department develops plans and coordinates courses of instruction, methods of training, films and exhibits to be used by all the plants. Each plant has its own training department with representatives working in all other departments.

Training for steel occupations is almost entirely on the job. Some women have been recruited from those who have had pre-employment vocational courses in machine-shop practice, welding, inspection, and drafting, but the needs and opportunities for women workers along these lines are limited. Most of the jobs for women are of a labor type and little training is needed beyond that which can best be given on the job, such as handling shovels, cleaning equipment, piling bricks. In one plant new women are given several hours of classroom training in the proper methods of lifting, carrying, handling shovels, and loading and moving wheelbarrows. Correct methods are demonstrated and each recruit is required to demonstrate and have her application of the instruction criticised.

Crane operators are given very careful instruction before being put in charge of cranes. In one plant when the decision was made to employ women instead of men in a new mill, the women selected for crane operators were given 40 hours of intensive training by key crane operators, using the cranes in a division of the company that was experiencing a temporary lull in operations. When the women crane operators were placed in the new mill they were able to operate the new cranes, which tended to minimize the objections of the superintendent and foremen of the division to women operators. Where women crane operators are employed in Pennsylvania, it is necessary to have the crane and the ladders or steps used in climbing to the cab approved by the State Industrial Commission, and the women must work as trainee operators with an experienced operator in the cab for at least 30 days. This is a longer period than is given to training men operators, and it is considered longer than necessary for women and may have tended to deter their employment. Plants in other areas reported training men and women as crane operators in 10 days or 2 weeks.

Laboratory aides or technicians are in some cases considered as trainees on the job for various periods. In one mill the women are not paid the rate for the job until able to perform four basic tests satisfactorily. Before that they are classified as "washhouse attendants," at a rate of about 10 cents an hour less than the going rate.

In some mills plant clerical workers, even those with considerable office experience, are classified as learners for various periods and are paid rates considerably less than those formerly paid to men. Their learning period is devoted not to formal training but to becoming familiar with practices and policies of the plant. Since there had been no such plan for men, this constitutes a wage discrimination toward women.

Women in personnel work.

Old-established plants taking on appreciable numbers of women for the first time, as well as the new war plants, have accepted fairly generally the idea that there should be women personnel workers—counselor, matron, welfare adviser, and social worker being some of the titles—whose duties are to lessen in some way the impact on both women and management of the new employment status of women. In normal times in woman-employing industries there have been women personnel directors, interviewers, and welfare workers concerned especially with women personnel, but in the last two years their numbers have mushroomed. Often the duties of the position are not well defined and the work done depends on the resourcefulness of the counselor in making an effective place for herself in the organization. In some plants the women personnel workers are little more than police matrons, who patrol the toilets and rest rooms, supervise the wearing of work clothing—a time-consuming job—and represent management when disciplining appears to be in order. In others the duties seem to be only quasi-personnel and largely welfare, with emphasis placed on advising on child-care, home, and personal problems. In still others women personnel workers study the jobs, the working conditions, and other factors of women's employment; interview, select, place, and induct; help with the training and follow up the women on their job performance—a real personnel job.

Most of the steel plants have women attached to the personnel department to serve in some capacity. In one of the large companies the main office has a woman consultant who advises and coordinates employment policies and practices for women throughout the many plants in the organization. In one of the largest plants of this company a separate employment office for women has been established, with a woman in charge. This woman has women assistants who interview and place the women applicants, using mental and aptitude tests as an aid. The woman in charge worked for many years in one of the plant offices and is steeped in knowledge of the conditions and jobs. In addition she has the most essential attribute of good judgment, and has a sympathetic appreciation of the possibilities and problems of the women as well as the needs of the company. Plant policies, hours, wages, safety program, work-clothing regulations, and so forth are explained to the applicants before they leave her office. She is at all times available to the women to talk over their jobs and personal problems, and she serves as a liaison person on special difficulties of women workers, at the request either of the women or, on the other side, of foremen or superintendents. This company tended to select women for the new women's-counselor jobs from their nursing force, from foreladies in the sorting departments of the tin mills, or from office workers whose past records indicated suitability and adaptability for such work. A person who has a background in the industry and who is known to the foremen as an old employee inspires confidence and acceptance by both workers and foremen.

Usually in the steel mills there are only a few women—1 to 4—assigned to the special women's personnel work, but in 1 plant a women's division that has been made a part of the industrial rela-

tions department is composed of a supervisor, an assistant supervisor, 9 senior matrons, and 46 shift matrons. This department is not concerned with the initial employment and placement of women, but advises on suitable jobs and types of women to be hired.

Though the matrons here have their desks in the women's rest rooms and keep a close supervision of the service facilities for women, they are not "matrons" in the usual sense of this job title. They are given several days' training in safety, first aid, sanitation, work clothing, wage systems, job-instruction techniques, relations with foremen and supervisors, State laws covering women workers, and their general duties and responsibilities on the job. Women workers in the plant are supposed to bring their grievances and problems to the matron, who is required to know the women's jobs in her departments, to check on the women's performance on jobs, their observance of safety rules, clothing requirements, and misuse of rest periods, to answer questions about wages, tax deductions, and so forth. The matrons are expected to preserve order and maintain discipline among the women. Unfortunately, some of them are so conducting themselves as to be considered disciplinarians rather than counselors by the women workers and consequently are much resented.

The senior matrons supervise and coordinate the work of five or six matrons, supervise and train new matrons for 2 to 3 weeks, and make orientation and induction talks to new workers in the departments they cover. The senior matrons are stationed permanently on the day turn and the others rotate weekly, so all have the advantage of this senior counseling at regular periods.

Experience, judgment, and common sense in dealing with human beings seem to be the chief requirements for a woman counselor. Academic background is of only secondary importance. Women counselors who have no well defined status and are used only to police the women neither add to the morale nor increase the efficiency of women on the job. Unless the counselors are assigned duties that really relate to the effective employment of women, and authority to promote and enforce policies affecting the women's welfare, their positions as advisers on personal problems and as police matrons cannot be considered good personnel work.

Welfare facilities.

After a steel mill decides to employ women, usually the next consideration is to plan for service facilities, or welfare stations as they are called in steel. Additional toilet rooms, washing facilities, cloak, rest, and lunch rooms are required. Steel being an old industry has many old buildings, with equipment designed and installed in the days when the workers' comfort and convenience were secondary considerations in most plans. Men's facilities in some cases provide only the meager essentials and are not too adequate in number, so men's welfare stations can not be cleaned up, remodeled a bit, and turned over to women because frequently there is nothing to convert. New locations must be found, priorities for equipment secured, and delivery and construction engineered and effected. Even with priorities the de-

livery of equipment may be slow, and in some of the mills the lack of service facilities delays the employment of women. When the new facilities are ready, they are in most plants far better than those provided for the men and will fill a need for the men even if women do not remain long in the industry. Occasionally, because of the uncertainty as to numbers of women to be employed and the temporary stay probable in their case, management has hesitated to spend a lot of money for special facilities and the provisions are crude and not always convenient. On the whole, however, the numbers of toilets, washing facilities, dressing and locker rooms are adequate. State requirements along these lines are met.

Washing facilities are equipped with hot water in most cases and the spray-fountain type of equipment is common. Difficulty in securing either paper or linen towels, soap and containers, is reported; further, in many plants it has been the custom for men to provide their own soap and towels. Paper towels are not too satisfactory for bathing, nor for drying larger body surfaces than the hands, so workers still tend to have their own towels and soap and keep them in their lockers. Some washrooms are adequately equipped with both paper towels and soap, but it is not general. Because of the dirty nature of the work, showers are provided more generally in steel than in other industries. Many adequate shower rooms were inspected and evidently are much used, especially in the summer months.

Lockers and dressing-room facilities usually are connected with the central toilet rooms. Floor racks and hooks on the wall are in a few cases the only equipment, but in most plants individual wooden or steel lockers are available for the women. Several mills have chain lockers—overhead racks with hangers and baskets for shoes and the miscellaneous odds and ends such as hats, purses, and gloves. Individual chains on pulleys raise and lower the hangers and baskets, and each worker padlocks her own chain for safekeeping of her possessions. This is a most satisfactory arrangement where space is too limited for standing lockers. Dressing rooms are sometimes extremely crowded during shift changes and the ventilation is poor.

Rest rooms, rarely provided for men, are a new feature for women in the steel industry. The facilities are not so adequate as the more essential ones—toilets and washrooms—and sometimes are entirely absent. There is a real need of at least a few cots, long sofas, or benches where women who are temporarily indisposed or fatigued can lie down for a few minutes. The elaborate clubroom type of furnishings is not essential, though in a few mills the new rest rooms provide a lounging-room atmosphere with rugs, draperies, and easy chairs and sofas.

Lunch rooms, tables and chairs, and in some cases a hot plate to heat soup and drinks usually are provided, this too an innovation in the mills, as men eat at their workplaces. Such facilities generally are a part of the welfare station. Food facilities in the way of restaurants, cafeterias, canteens, and so forth usually are poor.

Nourishing, well prepared food, hot or cold as required, milk and hot drinks, a place to sit down while eating in a clean ventilated

room should be the minimum standard of food provision for employees. The restorative value of the mid-shift break to the worker, both as a human being and as a cog in industry, is increased by a satisfactory lunch. Good lunches can be packed at home, but unfortunately many workers have no time themselves nor anyone to prepare their lunch. The steel industry—or so it seems in many plants—has a traditional conservative attitude that good cafeterias and lunch rooms are for the light industries. Steelmen grab a bite out of their lunch pail and a swallow of hot coffee whenever there is a lull.

Only a few of the mills have adequate or desirable lunch rooms. In most cases they are drab and dirty places run by concessionaires whose incentive is the profit motive, not food or service for the employees. Usually they are places where soft drinks and food—pies, cakes, and sandwiches—can be purchased to carry back into the mill. When an agent of the Women's Bureau commented on the unsatisfactory lunch rooms, the reply was that lunch periods are on company time and the plan is to avoid making the eating places comfortable or attractive loafing centers. Because of the wide expanse of the units that make up a steel plant, a central lunch room would be inaccessible to most of the workers. Food wagons or mobile canteens carrying food and drinks from a central kitchen and distributing them in wholesale lots to department lunch rooms or by direct sale from the mobile unit have been found feasible and satisfactory in many of the new war industries. There seems to be no reason to assume that steelworkers do not need and appreciate good food and eating facilities as much as other workers. By having tables, chairs, or benches and in some cases hot plates in their rest rooms, the women have more than the men, but eating facilities in the steel industry are not good.

Medical facilities.

First-aid and medical facilities are better in steel than in most industries. Health and safety programs are of many years' development. Most of the larger mills have hospitals with doctors on duty or on call at all times. All mills have arrangements for caring for first-aid cases at any time. In the large mills ambulances or special cars are on call to transport ill or injured workers.

All the mills visited have a preemployment examination and the nature of this preemployment physical screening varies from a quite superficial examination to a complete physical covering eyes, ears, heart, lungs, blood tests, a hernia check, and a listing of all disease and injury experience to serve as a basis for rejection or placement and for background data for future illness or injury.

Some of the plants have a program of follow-up examinations for certain occupations at intervals of from 3 months to a year. The employees for whom follow-up examinations are required are riggers, crane operators, all who do high climbing, operate railroads, drive tractors, or control equipment that involves the safety of others, and workers exposed to fumes from molten lead or lead products. On inspection jobs where perfect vision is required, periodic eye examinations are a part of the medical program in some plants.

Accidents and strains.

Accident-prevention and safety education, as already suggested, has been a crusade in the steel industry for many years, so in most of the mills the safety departments are consulted in determining and recommending jobs that are suitable for women. Generally women are placed on the least hazardous and strenuous jobs in the plants. Few severe accidents to women have been reported. Slight burns, minor cuts and lacerations, pinched fingers, foreign bodies in eyes, foot injuries from falling objects have been reported, but severity and frequency rates are lower for women than for men. At the time of the survey, none of the plants had calculated separate figures on accidents for men and women, but the concerted opinion of the safety men interviewed was that women were proving safe workers.

Of course women are not exposed to hazards and strains so severe as those of men. Exposure to outside weather conditions; heat and drafts inside many departments; burns and fumes from hot metal; dust; blast-furnace gas (carbon monoxide); the hazard of falling from trestles, from platforms, from slanting-bottom-hopper feeding cars, and from uncertain footing of rough floors; and strains from lifting, are the most usual accident possibilities. Safety meetings, safety posters, pep talks on careful work habits, and demonstration of the proper methods of lifting generally are part of the induction procedure. Arbitrary standards as to the weight limits to be lifted by women are not usually set, as safety men realize that the weight lifted is not the sole determining factor and that frequency, distances carried, and methods of lifting must be considered. Limits of 35 and 50 pounds as the maximum loads for women were reported in a few cases. In one mill, however, two women were observed constantly lifting together and turning flat pieces of metal that weighed 120 pounds. In several instances, company representatives told of trying out women on jobs not considered heavy for men that proved too strenuous for women. Women's utilization as scarfers and grinders is limited because women have not been able to do the lifting and moving of billets that are incidental to such work. Some of the older types of cranes have heavy lever controls and women cannot manipulate them without undue fatigue and strain. Swing grinding where there is considerable pressure and arm movement is found too heavy. In some instances women are provided with lighter and shorter-handled shovels for clean-up and labor jobs. Safety men in the mills are conscious of the need of special precautions for women and seem to be meeting the problems of strains and hazards to women constructively.

Turn-over and absenteeism of women.

Turn-over in terms of monthly percentages was reported by 15 plants. The 15 plants' monthly turn-over ranged from 2.04 percent to 5.4 percent. No separate figures were kept for the women. Some plants estimated that turn-over was less for women than for men, some that it was about the same, and some that it was slightly more. Apart from those going to the armed forces, men left for higher wages or to learn trades in other industries,

and a considerable group were reported as unstable employees with job-shopping tendencies. Women left less frequently for higher wages. Their terminations were in most cases attributed to home duties, child-care problems, or not liking the type of work offered them in the mills.

Only four of the mills had absenteeism figures separate for men and women. These are as follows:

Percent absent	
Male	*Female*
3.47	4.75
1.00	1.65
1.80	5.63
4.17	6.35

In all four of these mills the absence rate was considerably higher for women than for men. The chief reason given for women's absence was illness of self or other member of the family. For all employees, absence rates were reported as from 1 percent to 8 percent. Most of the mills were attempting to reduce absenteeism by conferences with supervisor and absentees, by requiring a written statement of reasons for lost time, by having company representatives visit or telephone the absentees. Some plants felt that these methods were beneficial, but others were doubtful that they had any real effect on absenteeism. A number of mills reported that absence was not a problem; in fact, there seemed little uniformity among the plants in attitudes, figures, and practices in the handling of absenteeism.

Employee organization and women's membership.

United Steelworkers of America (CIO), through its locals, had agreements with all but two of the steel plants visited. Independent unions bargained in the other two plants. The unions have welcomed the women steelworkers to their organizations and both management and local unions reported that women have joined the unions with fully as much alacrity as men. Two mills reported that 98 percent of the women plant workers were union members. In a number of mills women shop stewards are representing the workers, and a few women are serving on grievance committees. At least some of the local unions have not encouraged active participation in union affairs by the women. They are regarded as having tenure only for the duration of the war and so it seems hardly worth while to encourage their activities or develop leadership among them. No women were reported as members of labor-management committees.

One union local recently had brought to the Regional War Labor Board a case concerned with starting rates unequal for men and women and had received a decision that abolished the discriminatory learners' rates for women.

Women's seniority on the job is recognized for the duration of the war, but it is assumed by both the union locals and the management that in the post-war era women will return to their peacetime activities. Management representatives reported that the seniority provisions in collective-bargaining agreements have interfered with the full utilization of women on jobs that would be

suitable for them but which they cannot reach with their lack of seniority rank.

NOTE.—Representatives of the union made the statement that the steel firms have employed women for the purpose of filling a gap in their working force resulting from inequitably low wage rates for the starting jobs. Having reached the point of being unable to fill these jobs at the bottom rungs of the wage ladder with male workers, the steel firms resorted to the employment of female workers. In many instances these hard laboring jobs are not suitable for women, and the primary reason why women have been employed is that the firms became unable to secure men at the rates paid. Had the industry upped the wage rates for the lower jobs, men would have been available and women could have been employed for work for which they are better adapted.

APPENDIX

Occupations In Which Women Are or Have Been Employed, 41 Steel Mills, by Department

[Engineering aides, Clerks, Messengers, Guards, Nurses, Counselors, and Janitresses are not included. These are clerical or allied and service workers whose activities are not directly connected with production.]

Occupation	Coke and by-products	Blast furnaces	Steel works	Rolling mills	Other finishing and fabricating depts.	Laboratory and quality-control	Power and fuel	Shipping and warehouse	Shop maintenance	Yard, track, and transportation
Acetylene-generator tender					★					
Air-compressor op. and learner							★			
Annealer and helper				★	★					
Assembly—miscellaneous				★	★				★	
Assorter and helper and learner				★	★					
Bagging sulphates	★									
Banding, hand and mch. op. and helper				★	★			★		
Bending wire					★					
Billeteer-mch. op				★						
Blacksmith helper									★	
Boilermaker helper									★	
Bolt-threading-mch. op					★					
Bomb and shell machining					★					
Bonderizer and helper				★						
Brakeman and switchman										★
Branner-mch. op				★						
Brickmason helper	★	★	★	★						
Bundler and helper and learner				★						
Burner and flame cutter and helper and learner		★	★	★	★	★			★	
Burrer					★				★	
Cable splicer									★	
Car-block learner								★		
Car bracer				★						
Car checker and loader and helper				★				★		
Car dumper	★									
Car-repair helper			★							★
Carbometer (inspector)			★			★				
Catcher—tin mill				★						
Chauffeur										★
Checker				★	★	★		★		★
Checker-chamber clean-up			★							
Chemist and learner	★		★			★				
Chipper—boiler shop									★	
Cleaning ore cars		★								★
Controlman and learner	★			★						
Coremaker and helper									★	
Cover op				★						
Crane hooker and learner			★	★	★			★	★	
Crane op. and learner	★	★	★	★	★			★	★	★
Cut-off op. (pipe)				★						
Dipper and dryer (coils)									★	
Door puller			★							
Drill-press op									★	
Electric-locomotive op			★							★
Electric shop—bench work, and helper		★		★	★				★	
Expediter			★	★						
Feeder		★		★	★					
Filterman		★								
Fire-clay mixer			★							
Flue blower							★			
Forelady and leadwoman				★	★	★		★		
Forming-and-crimping-mch. op					★					
Foundryman helper									★	
Furnace charger and heater				★						
Furnace feeder				★	★					
Galvanizer				★						
Gear cutter									★	
Grinder and learner				★	★	★			★	
Heater helper	★									
Heat-treat man and helper				★	★				★	
Helper not elsewhere classified	★	★	★	★	★	★	★		★	
High-line laborer		★								★
Hot-bed operator				★						
Hot-top knocker			★							
Inspector and helper and learner				★	★	★	★		★	
Instrument-repair learner									★	
Keg and spool maker				★						

Occupations In Which Women Are or Have Been Employed, 41 Steel Mills, by Department—Cont.

Occupation	Coke and by-products	Blast furnaces	Steel works	Rolling mills	Other finishing and fabricating depts.	Laboratory and quality-control	Power and fuel	Shipping and warehouse	Shop maintenance	Yard, track, and transportation
Laboratory aide; technician	★	★	★	★	★	★	-----	-----	★	-----
Laborer—clean-up	★	★	★	★	★	★	★	★	★	★
Laborer not elsewhere classified	★	★	★	★	★	★	★	-----	★	★
Larry and skip-car op. and helper	-----	★	-----	-----	-----	-----	-----	-----	-----	-----
Lathe op., engine and turret	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Lay-out man and helper and learner	-----	-----	-----	★	★	-----	-----	-----	★	-----
Learner not elsewhere classified	-----	-----	-----	★	★	★	-----	-----	★	-----
Leveler op. and learner	-----	-----	-----	★	-----	-----	-----	-----	★	-----
Lithograph op.	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Loader	★	-----	★	★	★	-----	★	★	★	-----
Locomotive-repairman helper	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Looper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Luterman and helper	★	-----	-----	-----	-----	-----	-----	-----	-----	-----
Machine op. not elsewhere classified and helper and learner	★	★	★	★	★	★	-----	-----	★	-----
Maintenance shop—bench work	-----	-----	★	-----	-----	-----	-----	-----	-----	-----
Mark, stamp, and stencil	-----	-----	-----	★	★	-----	-----	-----	★	-----
Metallographists	-----	-----	-----	-----	-----	★	-----	-----	-----	-----
Milling machine	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Millwright helper	★	-----	-----	★	-----	-----	-----	-----	★	-----
Misc. fabricating jobs	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Molder and helper	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Nail-machine helper	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Nailer and wirer—kegs	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Nipple man	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Nutting bolts	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Observer and learner	-----	-----	★	★	★	★	-----	-----	-----	-----
Oiler and learner	-----	★	★	★	-----	-----	★	-----	★	-----
Pack and wrap	-----	-----	-----	★	★	-----	-----	-----	-----	-----
Painter and helper	-----	-----	-----	★	★	-----	-----	-----	★	-----
Panman	-----	★	-----	-----	-----	-----	-----	-----	-----	-----
Pattern storage man	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Piler	-----	-----	-----	★	★	-----	-----	-----	-----	-----
Pipe fitter helper	★	-----	-----	-----	-----	-----	-----	-----	★	-----
Pipe cleaner	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Pipe coater	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Pipe reamer	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Platform girl	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Polisher	-----	-----	-----	-----	-----	★	-----	-----	-----	-----
Preheater learner	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Printing tags	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Pump and still attendant	★	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pump tester	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Pyrometer—checker	-----	-----	-----	-----	-----	★	-----	-----	-----	-----
Recorder and helper	-----	★	★	★	-----	★	★	-----	-----	-----
Rigger helper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Road repairman	-----	-----	-----	-----	-----	-----	-----	-----	-----	★
Roll-turner apprentice	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Roundhouse laborer	-----	-----	-----	-----	-----	-----	-----	-----	-----	★
Sandblaster helper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Sandman	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Saw op. and helper	-----	-----	-----	★	★	★	-----	-----	★	-----
Scale blower	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Scaler	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Scarfer and helper and learner	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Scrapman	-----	-----	★	★	★	-----	-----	-----	-----	-----
Screen-station op.	★	-----	-----	-----	-----	-----	-----	-----	-----	-----
Shaper	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Shear op. and helper	-----	-----	-----	★	★	-----	-----	★	★	-----
Shipping and warehouse laborer	-----	-----	-----	★	★	-----	-----	★	-----	-----
Sinter labor and mch. op.	-----	★	-----	-----	-----	-----	-----	-----	-----	-----
Slag sweeper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Solderer	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Sorter—nails	-----	-----	-----	-----	★	-----	-----	-----	-----	-----
Spark tester	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Speed regulator	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Spooling wire	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Stamper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Steam-hammer op.	-----	-----	-----	-----	-----	-----	-----	-----	★	-----
Stocker helper	-----	-----	-----	★	-----	-----	-----	-----	-----	-----
Storeroom attendant	-----	-----	-----	★	★	-----	-----	-----	-----	-----
Stoveman helper	-----	★	-----	-----	-----	-----	-----	-----	-----	-----
Straightener and gag-press	-----	-----	-----	★	★	-----	-----	-----	-----	-----

Occupations In Which Women Are or Have Been Employed, 41 Steel Mills, by Department—Cont.

Occupation	Coke and by-products	Blast furnaces	Steel works	Rolling mills	Other finishing and fabricating depts.	Laboratory and quality-control	Power and fuel	Shipping and warehouse	Shop maintenance	Yard, track, and transportation
Substation tender							★			
Sulphate-dryer op	★									
Test carrier	★	★	★	★		★				
Test driller						★				
Threading									★	
Tool-crib attendant and learner				★	★	★			★	
Topman		★								
Torch-repair helper									★	
Torpedo-net assembly					★					
Tracer, chaser			★	★	★	★				
Tractor-lift op. and learner			★	★	★			★		★
Track cleaner										★
Trainee—mill	★	★	★	★	★	★	★	★	★	★
Trainee not elsewhere classified									★	
Transfer-buggy op.; tram op. and learner			★	★		★			★	
Transfer-car op		★								
Transfer-table op				★						
Truck driver and helper								★		★
Trucker, hand					★					
Tumbling nails					★					
Upsetter-mch. op				★	★					
Upset tester						★				
Water softener and helper							★			
Weigher and helper			★	★	★					★
Welder and helper and learner				★	★				★	
Welder apprentice				★						
Wharfman	★									
Whitewasher									★	
Wire cutter				★						
Wire drawer and helper and learner				★						

Percent Distribution by Department of 8,222 Women Plant Employees in 17 Plants of a Steel Corporation

Department	*Percent of women*
All departments (8,222 women):	100.0
Ore docks	.8
Coke and by-products	2.6
Blast furnaces	4.5
Steel works	5.0
Rolling mills	39.8
Bar and rod	5.9
Bloom and billet	9.5
Plate	7.4
Sheet-tin plate and strip	9.1
Slab	.8
Structural	3.9
Rail	1.2
Other and not specified	1.9
Other finishing and fabricating depts.	9.0
Laboratory and quality-control	13.9
Power and fuel	1.4
Shipping and warehouse	1.1
Maintenance and service	19.8
Shop maintenance	14.4
Brickyard and masonry	1.3
Yard, track, and transportation	2.6
Plant protection	.9
Construction	.2
General	.4
Clerical, engineering, and accounting	1.2
Department not specified—labor	.9

Typical Hourly Rates of Women at Time of Survey, by Department

RECEIVING, COKE OVENS AND BY-PRODUCTS, AND BLAST FURNACE AREAS

Hourly Rates[1] *(cents)*	*Jobs*
78 and 79½	Laborer such as clean up, topman, panman, car washer, sulphate bagger, bin stocker, luterman helper.
81	Panman, bricklayer helper.
81½	Stove cleaner.
82½	Larryman helper.
84½	Crane operator in cast house.
87	Cinder crane operator.
96	Benzol-still attendant.
97½	Larryman.

STEEL FURNACES—OPEN HEARTH, BESSEMER CONVERTER, AND ELECTRIC

78 and 79½	Laborer, ladle-liner helper, hot-top knocker, brick handler, test carrier, hooker, buggy operator.
81	Scrap burner.
82½	Hooker stock yard.
84½	Door operator, ingot-mold crane operator.
85½	Observer, spectroscope.

ROLLING-MILL DIVISIONS

62½ and 63	Assorter learner tin plate.
78 and 79½	Laborer, clean-up-gang member, pit cleaner, cover and door operator, heat number carrier, cut-off saw operator, hot-bed helper, hooker, slab-car operator, gag-press helper, learners (burning, scarfing, grinding, etc.), tin bundler, assorter, car blocker helper, painter helper, test carrier, car checker, stamper, billet painter, gag-press control man, test recorder, gager, assorter tin plate.
80	Hooker, weigher, straightener.
81	Burner helper, furnace helper, piler operator, furnace tender and heater.
81½	Cold transfer operator, stamper, shear operator, scarfer, painter, weigher, saw operator.
82	Gag-press control.
82½	Centerless grinder, scrapman, cold saw hooker.
83½	Cold steel recorder, steel tracer, buggy operator (tow trucks, lift trucks, etc.).
84	Transfer table operator, grinder.
84½	Crane operator, hooker, ingot-buggy operator, scarfer.
85½	Hot-bed operator, hydraulic-shear operator, screw operator.
86	Recorder, burner, furnace tender, hot-bed operator.
87	Straightener, weigher.
87½	Stamper, painter, piler operator.
88	Hooker.
88½	Billeteer operator, chisel grinder.
89½	Leveler operator, loader, expediter roller line, recorder.
90	Recorder.
91	Car checker, recorder, swing grinder.
91½	Crane operator, expediter-loader.
93½	Scarfer, hooker, heat-treater.
94	Loader.
95	Grinder.
96½	Test recorder.
97	Crane operator.
100	Grinder.
110	Contract recorder.

MAINTENANCE SHOPS

78	Laborer, matron, janitor, sandman, loader and unloader bricks, coil winder, helpers (blacksmith, boilermaker, coremaker, locomotive repair, welder, meter repair, babbitman, molder, pattern maker, machinist, die changer, die polisher).

Hourly Rates[1] *(cents)*	*Jobs*
78 to 89½	Machine operators (lathe, turret lathe, drill press, boring machine, shaper, gear cutter, grinder, etc.), lay-out and bench work.
79½	Oiler.
80	Repair helper, hooker, painter, tool-room attendant, electrical bench work.
80½	Sand-mixer helper.
82	Oiler.
82½	Helpers (bricklayer, etc.), safety-goggle repairman.
83½	Millwright helper, tool-room attendant, route and dispatch clerks, crane operator.
84½	Machinist helper.
85½	Hooker.
86½	Oiler.
87	Motor inspector helper.
88	Tool grinder.
89½	Machinist helper.
90	Die reamer, machine operator.
91	Crane operator.
91½	Truck operator.
95½	Crane operator.
97	Welder, planer operator.
102½	Acetylene tool repair.
105	Die polisher.
	LABORATORY AND QUALITY-CONTROL
78	Inspector, test carrier, test reporter, observer, laboratory aide, helper, carbometer.
80½	Laboratory aide, test drilling and machining.
83	Test polisher, inspector, observer, pyrometer observer.
84½	Inspector and machine operator.
86½	Saw operator.
87	Laboratory aide.
90	Machine operator.
94½	Chemist.
97½	Milling-machine operator.
99½	Alloy inspector and tester.
108, 110, 115½, 126	Chemist and metallurgical technician.

[1] Many jobs have bonuses, which increase earnings above rates.

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192-6

UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, Secretary
WOMEN'S BUREAU
MARY ANDERSON, Director

EMPLOYING WOMEN IN SHIPYARDS

By
DOROTHY K. NEWMAN

BULLETIN OF THE WOMEN'S BUREAU, No. 192-6

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LETTER OF TRANSMITTAL

United States Department of Labor,
Women's Bureau,
Washington, April 27, 1944.

Madam: I am submitting herewith a report setting forth the conditions that should govern the employment of women in shipbuilding, the field that presents more difficulties than any other in which considerable numbers of women have been taken on.

Based on the Women's Bureau standards of many years and the findings of its field investigators in visits to 41 yards in 1943, 35 of which were employing women on production, the report covers the most vital of the employment problems, from a thorough job analysis and plant changes in preparation for the advent of women, through their selection and placement, their induction, indoctrination, and training, their counseling and oversight, measures for their safety and comfort, to efforts to prevent separations and so lessen turn-over in the case of the unadjusted.

The report was written by Dorothy K. Newman of the Editorial Division. Jennie Mohr, of the Research Division, wrote the recommendations on safety.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,
Secretary of Labor.

Women's Occupations in 35 Shipyards, Distributed by Place of Work, Shop, or Department

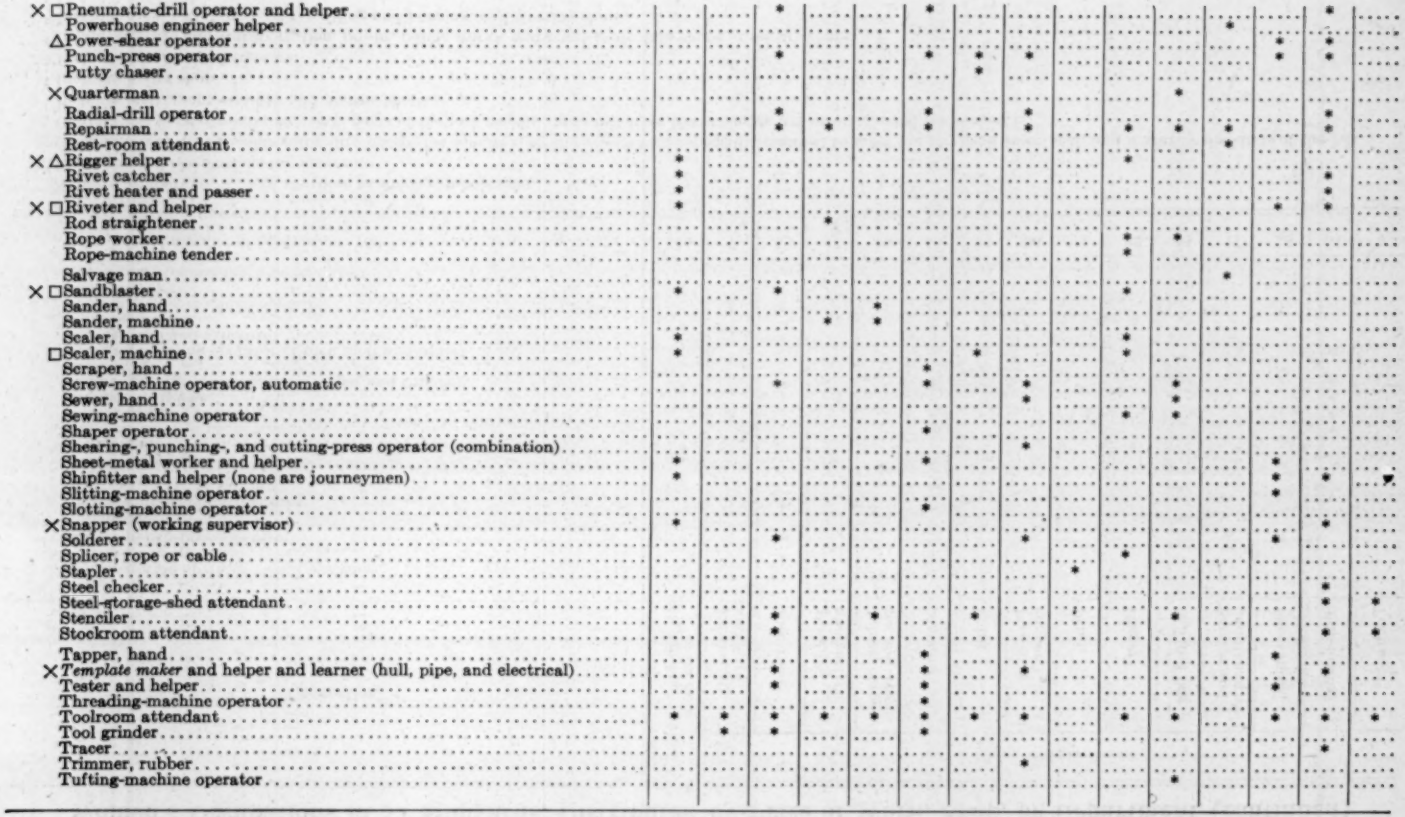
Occupation	On board ship or on hulls	Shop or department														
		Blacksmith and forge	Electrical[1]	Foundry and pattern	Joiner, carpenter, shipwright	Machine[2]	Paint	Pipe and copper	Print	Rigger[3]	Sail and flag	Service and maintenance[4]	Sheet metal	Ship fitting[5]	Toolroom[6]
Acetylene-burner operator and helper (hand burner)	*		*			*		*					*	*	
Arbor-press operator			*										*		
Asbestos filler and sewer								*							
Asbestos layer-out and cutter								*							
Assembly worker, bench and other			*			*		*					*	*	
Band-saw-machine operator			*	*				*					*	*	
Battery filler and tester			*												
Battery reader	*		*												
Bead-machine operator													*		
Bench-lathe operator			*			*									
Bench worker			*			*		*					*	*	
△Bending-roll operator (cold press and mangle roll)		*	*										*	*	
Binder									*						
Blacksmith helper		*													
Blade straightener						*									
Boatbuilder helper					*										
×Boiler builder						*									
Boilermaker helper						*									
Bolt-cutting-and-threading-machine operator						*									
Bolt-threading-machine operator						*		*							
Bracket-tipping-machine operator									*						
Braiding-machine operator										*					
△Brake-machine operator													*	*	
Brazer			*					*					*	*	
×△□Bucker-up (sheet metal and *steel*)	*												*	*	
Cable finisher			*												
Cable stripper, hand and machine			*												
×□Calker (on wooden boats), trainee	*													*	
Canvas worker											*				
Carpenter or shipwright helper					*										
Castings cleaner (with grinding wheel)				*											
Chain-ladder maker													*		
Chromium plater			*												
Circular-saw-machine operator					*										
×△□Cleaner (*ship*, shop, *tank*, yard)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Clerical worker, shop	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Coppersmith helper								*							

Core cleaner				•											
△*Coremaker* and helper				•											
Crane operator, electric overhead and electric portable			•	•	•	•		•		•			•	•	•
Crane safety watcher										•					
Cushion man											•				
Cut-off-saw-machine operator (metal bar stock, bolts, cable)			•	•		•								•	
Cut-off-saw-machine operator (wood)					•										
Cutter, hand (sheetmetal)													•		
Cutting-machine operator (cloth)											•				
Cutting-machine operator (metal)			•			•							•		
×Deckhand	•									•					
Die-sinking-machine operator						•									
Dipper			•				•								
Do-all-saw-machine operator						•							•	•	
Drill-press operator, single and multiple spindle			•		•	•		•					•	•	
Driller, hand			•		•										
□Driver (automobile, *bus*, jitney, *truck*; panel, mail, or station wagon)		•											•	•	
Drop-hammer operator								•							
Elbow maker						•									
×Electrician, *journeyman* and helper	•		•												
Elevator operator													•		
Embossing-machine operator			•					•						•	
Engine-lathe operator			•			•									
Engraver, flatware			•												
Engraving-machine operator			•			•									
Escort													•		
Fire watch	•									•			•		
Flag maker; beading preparation and sewing											•				
△Flanging-press operator and helper														•	
Folding-and-perforating-machine operator									•						
×Forelady									•						
Forming-press operator			•			•								•	•
×△Furnace tender															•
Garage service attendant													•		
Gardener													•		
Gasket cutter								•							
Gear-cutting-machine operator						•									
Generator operator			•			•									
Glasscutter and grinder							•								
Grinding-machine operator (dry and wet; cylindrical, internal or surface with magnetic chuck)			•			•								•	•
Grinding-machine operator (portable)	•														
Guard													•		
Hydraulic-press operator (automatic)														•	
Inspector						•									
×Jointer-machine operator														•	
Kick-press operator														•	
Labeler, hand							•								

For footnotes see end of chart.

Women's Occupations in 35 Shipyards, Distributed by Place of Work, Shop, or Department (continued)

Occupation	On board ship or on hulls	Shop or department													
		Blacksmith and forge	Electrical[1]	Foundry and pattern	Joiner, carpenter, shipwright	Machine[2]	Paint	Pipe and copper	Print	Rigger[3]	Sail and flag	Service and maintenance[4]	Sheet metal	Ship fitting[5]	Toolroom[6]
Laboratory assistant			*				*								
Laborer, miscellaneous process	*		*	*	*	*	*		*	*		*	*		
Laborer, service and maintenance												*			
Laundry service attendant															*
Layer-out and helper	*		*			*					*		*	*	
Lead liner								*							
Lead-press operator						*									
×Leadwoman	*											*			
Loftsman helper									*					*	
×Machinist, *journeyman* and helper	*					*								*	
Masker	*						*								
Milling-machine operator			*			*									
Milling-machine operator (portable)	*														
Net maker										*	*				
△Nibbler operator														*	
Nipple-machine operator			*					*							
Oxyacetylene-cutting-machine operator (machine burner)						*								*	
Packer						*	*								
Paint grinder							*								
Paint maker							*								
Paint-shop attendant							*								
Painter, brush and helper	*		*	*			*								
Painter, radium dial						*									
Painter, sign and poster							*								
Painter, spray and helper	*		*			*	*			*		*	*		
Pantograph operator			*			*								*	
Pattern maker helper				*											
Pickling operator			*												
Pipe bender, machine and hand, and helper								*							
Pipe coverer and helper	*							*							
Pipefitter and helper					*			*							
Pipe tapper								*							
Pipe tester								*							
Pipe-threading-machine operator			*			*		*							
Planer operator (metal)			*											*	
×Planer operator (wood)				*	*										
Plumber, helper	*													*	



For footnotes see end of chart.

Women's Occupations in 35 Shipyards, Distributed by Place of Work, Shop, or Department (continued)

Occupation	On board ship or on hulls	Shop or department													
		Blacksmith and forge	Electrical[1]	Foundry and pattern	Joiner, carpenter, shipwright	Machine[2]	Paint	Pipe and copper	Print	Rigger[3]	Sail and flag	Service and maintenance[4]	Sheet metal	Ship fitting[5]	Toolroom[6]
Turning-lathe operator (wood working)				*	*										
Turret-lathe operator			*			*									
Turret-punch-press operator													*		
Upholsterer											*				
Unscrewing-machine operator			*												
Varnisher							*								
Vulcanizer					*	*		*							
×Watchman	*									*					
Weld checker	*													*	
Weld chipper						*								*	
Welder, acetylene														*	
Welder, arc (production, tack, helper and trainee)	*		*			*		*					*	*	
Welder, spot							*						*		
Welding-machine operator (Union melt and other)														*	
Winder, coil and armature			*												
□Wire brushman	*						*			*					
Wire-stripping-machine operator			*												
Wood finisher							*								
Wood-plug-making-machine operator					*										
Total number of occupations 189	35	7	58	17	19	55	24	36	8	22	18	17	38	51	7

Note.—Occupations in italic are those to which symbols refer.

× Some unusual occupations for women.

□ Occupations of questionable suitability except for women specially selected and specially qualified to meet the physical, emotional, and maturity demands of the job.

△ Occupations partially suitable. Only parts of the job, usually those requiring less strength, are recommended for women.

[1] Includes instrument, optical, and plating shops.

[2] Includes boiler shop.

[3] Includes laborers and erectors.

[4] Includes garage and transportation, power, public works, and plant protection shops or departments.

[5] Includes mold loft, fabricating, welding and burning, and riveting shops.

[6] Includes supply department.

Employing Women in Shipyards

THE NEED FOR GUIDANCE NOW

Recent and unprecedented employment of women.

Just a little over 2 years ago the subject and purpose of this bulletin would have been considered as fanciful as a tale from the Arabian Nights. That American women should take active part in the man's job of building and repairing ships was almost inconceivable. As recently as July 1941 an outstanding periodical made sport of the extreme anti-feminine attitude of what is now one of the most publicized woman-employing ship building and repair corporations in the country. At that time, nearly 2 years after war began in Europe and but 5 months before Pearl Harbor, women were not accepted by the firm even as office secretaries, and the lone women telephone operators were, as it was facetiously reported, "kept under lock and key."

Times have changed with lightning speed. By late 1943, thousands of women along both coasts and on the Gulf, Great Lakes, and inland waterways were actively engaged in almost every phase of ship building and repair work, and it is anticipated that it will be necessary to recruit thousands more before the war is over. Though the introduction of women into the shipyards did not begin in earnest until the fall of 1942, by January 1943 as many as 4 percent of all the production wage earners in the industry were women. The proportion had risen to a little over 5 percent by March, and by September to 9.5 percent. In January 1944 it was 10 percent. These figures include the 8 navy yards engaged in ship construction and repair, in which women have made extensive gains and comprised in September nearly one-fourth of the women wage earners in the industry.

Many adjustments required in an expanding industry.

The unprecedented influx of women into the shipyards has been the inevitable accompaniment of this country's tremendous war shipbuilding program, for which it has been necessary to recruit hundreds of thousands of additional workers since Pearl Harbor. The first 17 months of wartime production witnessed an increase of 189 percent in shipyard personnel. Old-established yards employing from 3,000 to 10,000 workers in 1939 and 1940 had 5 to nearly 8 times that many late in 1943, and there are some shipyards for which ground had not even been broken in 1940 that employed 20,000 to 40,000 workers in the spring of 1943 when the peak had not yet been reached. Expansion on so gigantic a scale in competition with other war industries and Selective Service

brought shipbuilders face to face with the necessity of employing women to help to produce the enormous tonnage so urgently needed.

Such rapid development alone carries with it innumerable problems of administration and plant adjustment, but coupled with the necessity for drawing on a labor element never before tried in the industry, the problems became extremely numerous and complex. Organized training programs had to be set up within the shipyards to provide instruction for the thousands of workers, men as well as women, who had never held tools before, much less seen a ship under construction. Special training was necessary for the supervisors who had never had so many workers under them, many having themselves only recently been promoted from the ranks. Rapid upgrading of men into the skilled and leadership jobs became a practical necessity for the most economical utilization of labor. As the nucleus of skilled and experienced workers has become dispersed and proportionately smaller, the training structure has grown in size and importance. In many yards now the training director helps to control the rate of accession and allocation of the labor force.

Personnel, medical, and safety programs have had to be enlarged and modified to accommodate the mass hiring, placement, and protection of inexperienced workers. Effective selection of thousands of employees in short periods of time has required careful study of procedures and change in methods and policies. Alarming turn-over and labor scarcity have resulted in the introduction in many places of transfer bureaus and exit interviewing.

If the administrative offices have been affected by the magnitude of the war shipbuilding program, those planning and supervising the actual work have had to make even more fundamental and drastic adjustments. Under normal circumstances, ship construction is custom work; each vessel, whether a "sister ship" or one of a kind, differs from every other in detail if not design and requires a complete set of templates of its own. Now, however, hundreds of ships of the same kind, particularly cargo vessels, are being made with standardized materials according to a single pattern. Consequently, mass-production techniques involving assembly-line and prefabrication methods have been sought and developed. Even in the case of the many ships that still are built to individual plan, the work has been broken down to meet the dearth of all-round craftsmen, thus allowing introduction and training of specialists to perform one part of a process, operate one machine, or concern themselves with but one section of the ship. Making all this more possible, the speedier and easier assembly technique of welding has almost replaced riveting wherever feasible and hand welding and burning are giving way to machine methods in some yards and on larger jobs. Automatic assembly fasteners are being used here and there instead of tack welding.

Such examples of the effect on the industry of the tremendously accelerated shipbuilding program could be multiplied. In their broader aspects most of the changes are similar to those made in

other industries under like pressure. Many have eased the way for the employment of women, especially those changes developed to meet the need for training and employing inexperienced men in great numbers and for building many ships of the same design. Others, however, have been required only because women were employed.

Lack of preparation for women's employment.

But the need to draw from the woman labor force often was not realized and accepted till the very last moment, leaving little time for study and planning. In many cases the management plunged headlong even before essential and obvious provision had been made to accommodate the newcomers. This was not surprising in view of acute manpower shortages in shipbuilding areas, yet it was nothing less than daring in an industry so bound in the tradition of dirt, sweat, and rough and tumble, so thoroughly male that any woman who ventured into a yard was greeted with hooting and whistling. The physical and administrative adaptations that should be introduced to insure women's efficient performance and necessary comfort on the job frequently are as nothing compared with the mental hurdles that must be overcome. Problems that are brought to the attention of those interested in women's success often stem as much from attitudes toward women workers in the man's world of shipbuilding as from the actual situation. Yet women frequently were taken on before the human or psychological adaptations necessary to avoid confusion, discontent, and waste, much less the physical and sometimes administrative changes necessary, had been attempted.

When field representatives of the Women's Bureau made visits to 41 shipyards between the beginning and the early fall of 1943, few yards had employed women for as long as a year; many had begun hiring women to do production work only a few months before; 6 had not yet hired any women for production work. Though the yards with women workers still were feeling their way, over half already were employing hundreds of women, some of them thousands, and in many cases expecting to hire hundreds or thousands more. While building more ships than ever before and servicing the Fleet, not a few were functioning under inadequate arrangements, hoping gradually to arrive at a satisfactory solution of their personnel problems with women. To be sure, some had already made excellent progress. Most had forged ahead in at least some phases, such as securing good safety observance, satisfactory rest- and wash-room facilities, and productively efficient distribution of the women on jobs; others were struggling with these aspects of the situation but had mastered other aspects. Many, aware of inadequacies, sought advice. Women's Bureau field representatives were asked in several of the yards visited to submit formal recommendations based on analysis and study of individual yard conditions and problems.

It is clear, then, that the shipyards are charting new seas in the utilization of the woman labor force, and the mistakes or successes that result may have a profound effect not only on the production and repair of ships, but on the cost and efficiency of such production and the health, work, and life histories of thousands of women. It is important to take stock now. Misconceptions should be dispelled, well-founded facts pooled, and the fund of information available from industries with longer histories in the employment of women disseminated. It is with these objects in view that the present report is submitted. It is the aim of the Women's Bureau through the recommendations and suggestions made here to promote conditions for the woman shipyard worker conducive to her most efficient and productive employment and her well-being as a member of society and the labor force.

Scope of the survey.

The material included here is based in large part on information secured from a comprehensive study of women's employment in American shipyards representing almost every kind of situation and located throughout the country's major shipbuilding areas. Drawn upon extensively also are the standards for women's employment recommended by the Women's Bureau and derived over its quarter-century of fact finding and reporting in the field of women in industry. An Act of Congress creating the permanent Bureau in 1920 outlined its duties as follows: "It shall be the duty of said bureau to formulate standards and policies which shall promote the welfare of wage-earning women, improve their working conditions, increase their efficiency, and advance their opportunities for profitable employment. The said bureau shall have authority to investigate and report to the said [Labor] department upon all matters pertaining to the welfare of women in industry." In performing these duties the Women's Bureau has collected and disseminated a wealth of factual material that has both general and specific application to the employment of women in shipyards. Selected additional sources of information and guidance are listed after each general topic discussed.

Among the questions it is hoped this report may help to answer are the following: What work in shipyards can women do safely and successfully? What plans should be made before more women are taken on? How should women be selected and placed on jobs? How should they be supervised under various yard conditions? Many of the suggestions offered in reply to these questions may be irrelevant in well-managed yards that have been hiring numbers of inexperienced men, for many of the problems issuing from the employment of women in shipyards are no different from those that arise from hiring any inexperienced workers. Recommendations are made also that emphasize good administrative technique and personnel policy that are effective with all workers but especially important in the employment of new workers or women. In addition, of course, are the various innovations and adjustments that affect only women.

Of the 41 shipyards visited by agents of the Women's Bureau, 35 had women on production work, these women comprising an estimated two-fifths of all women so employed in March 1943. Most of the yards (32) were on the North and South Atlantic coasts, 4 on the Pacific coast, 3 on the Gulf coast, and 1 each in the Great Lakes and Inland regions. Seven of the eight navy yards engaged in new construction and repair of ships were covered in the survey; each employed women on production. This was true also of all but 6 of the 34 commercial yards visited. Though ship-repair work is one of the least standardized, least predictable enterprises in wartime, women were employed in laboring, helper, and mechanic classifications in the 4 companies engaged wholly in repair work and in 11 of the 12 yards repairing and converting ships as well as building them.

GUIDES TO EMPLOYING WOMEN SUCCESSFULLY IN SHIPYARDS

Planning can prevent many problems from arising or at least can prepare for meeting those that are inevitable. It is best to make and to develop plans for assimilating and efficiently utilizing the woman labor force before any women are hired, but if some arrangements were not made, or by reason of haste could not be made, beforehand, steps should be taken to prepare for them and introduce them as soon afterward as possible. This is most important in the following procedures that will be discussed in detail below.

1. Secure the cooperation of men supervisors and workers.
2. Select and place women carefully.
3. Employ women only in jobs found to be suitable.
4. Pay women and upgrade them on the same basis as men.
5. Schedule an 8-hour day and a 48-hour 6-day week; allow a lunch period of at least 30 minutes, and rest periods of 10 to 15 minutes in each work spell of as much as 4 hours. Rotate shifts no more frequently than every two months.
6. Set up an effective woman employee counselor system.
7. Give new women workers preliminary induction into the work and environment of the shipyard before putting them on the job.
8. Provide personal-service, food, and medical facilities that meet approved standards of adequacy and quality.
9. Study and expand the safety program to adapt it to women workers, and instruct women thoroughly in safe work practice.

1. Secure the cooperation of men supervisors and workers.

Permeating all planning for the introduction of women into the work force and continuing for as long as necessary through the period of their employment, management should work to develop and preserve a friendly, businesslike, and cooperative attitude toward the new women workers on the part of the entire male personnel.

The men must be assured of their own job security; they must also understand the seriousness of the labor shortage and how profoundly their successful cooperation with the new women

workers will affect the Nation's ship production. The attitude of the men is particularly important since so many women are assigned to men journeymen for orientation and initial training and, in yards having no formal training program, the entire burden of instruction lies with experienced and skilled workmen. Under these circumstances a resentful and uncooperative male force can sabotage the women's program in many ways.

In large part, however, the first fears over women's adaptability to the unfeminine industry of ship building and repair have dissipated. Men workers and supervisors who were opposed to the employment of women in shipyards are finding women adaptable and capable. The opinion is now widely found among men supervisors that women should be allowed to do any work that men do, as soon as they are capable and providing the work is not beyond their physical strength.

To foster this attitude and secure the help of experienced workers, supervisors should be represented on and consulted by any committee, body, or group studying the work program for women, making job analyses, or gathering information on assignment of women to jobs.

Many yards, finding that their success with women lay largely in the hands of the lower level of supervision, have inaugurated definite planned training programs for supervisors. The most successful have been those with emphasis not on women as women but on women as employees. One training officer said very aptly, in reference to his methods of training supervisors to handle women, "Women *must* be supervised as men *should* be." Many of the successful supervisors' courses are predicated on the idea that women are simply new employees and that special consideration should be given new employees with no previous background or training.

Women workers in shipbuilding are analogous to a new tool. A measure of the success of a worker or a supervisor lies in his ability to use new or unaccustomed tools.

2. *Select and place women carefully.*

A good deal of complaint is being made these days of wasted labor in the shipyards. With proper selection and placement much well-deserved criticism could be avoided. The need for haste and the lack of a trained labor supply from which to pick and choose have led to haphazard hiring policies that result in human and material waste. The very lack of choice makes it imperative to consider each person's ability more carefully and to assign him to the task he can learn to perform.

The fundamental principles of good selection and placement are the same for all workers, men and women; the criteria by which women are selected and placed in some jobs and men in others depend on the principles that look toward hiring only those who can do a good job and placing each worker in the occupation for which he or she is best fitted. It is recognized that individuals

differ in their capacities and aptitudes and that there are in addition fundamental differences between men and women that affect the capacity of each to do certain types of work with maximum efficiency over a period of time. However, even in shipbuilding, a heavy industry and one ordinarily manned entirely by male workers, this leaves a broad occupational field in which women may be placed very satisfactorily, one in fact that has as yet been only partially explored in most yards. This makes it not only unnecessary, but grossly inefficient and economically wasteful, to place any woman in a job for which she is not suited. Furthermore, to place a woman, or a man for that matter, in a job beyond such person's normal physical ability is a social extravagance for which this and future generations will pay dearly.

Whereas the next section of this report considers in detail the shipyard occupations in which women as a group can be and are safely and successfully employed, this section deals with techniques of selection and placement of individual women to assure employment of each woman worker in one of the jobs, among those available and suitable, in which she can give her most efficient service.

There are several effective means and procedures available to those responsible for selection and placement. When used together by individuals having suitable experience in their operation and knowledge of their functions and interpretation, they will not only prevent serious error but in a positive way will affect immeasurably the economical and productive utilization of the labor force. They are worth both the time and the money they cost, especially in a period of labor shortage when the quality of applicants is lowest. They are worth the cost even when hundreds, perhaps thousands, of workers must be employed on short notice in a period of great expansion. To put these great numbers to work in haphazard fashion is to court serious future dislocation, absenteeism, and high turn-over, all costly ills. It is far better to foot the preventive cost of good selection and placement.

The means just referred to include, first, complete job analysis, then a good application blank, preplacement physical examination, properly standardized and administered tests, and an objective and comprehensive interview.

Job analysis.

Job analysis in this connection is not to be confused with the type of analysis that is made specifically for rate setting and employee evaluation. The job analysis in question here is a thoroughgoing job description to aid in selection and placement of the work force and in transfer and upgrading. It outlines exactly what the work entails as regards procedure, duties, and responsibility; the specific conditions under which it is performed (that is, workplace, hours, wages, hazards, exposures); the education, experience, training, tools, degree of skill, and physical effort needed to perform it; the opportunities and specific line of advancement and job progression involved; and the relation to other jobs, specially as regards transfer.

Such a job description or analysis has many uses in selection and placement of women workers. It breaks down the job into its component parts, thus making it possible to see whether or not the work is such that the average woman can or should perform it, and where dilution, reengineering, or rearrangement of the job will make it a more acceptable one for women. In other words, it can be used in the original allocation of jobs for women and in the procedure of getting jobs ready that originally may not have been suitable. Often this makes possible more efficient performance by both men and women.

The following are examples of modifications made in some of the shipyards visited by representatives of the Women's Bureau:

> In order to eliminate stretching to get at the work in the very large Covell Hanchet surface grinders, small platforms were built for women operators.
>
> Acetylene tanks weigh 450 pounds. After women burners were hired, gas was piped to all work locations to eliminate handling of the heavy tanks.
>
> The wooden tool boxes in which welders lock their equipment weigh 40 to 50 pounds. They are sent to women's workplaces. Their lines are hoisted onto hulls, eliminating carrying from docks.
>
> Steps have been built along the walls and a runway around the walls, so that women crane operators do not have to climb ladders to the overhead and bridge cranes.
>
> Wherever tools or parts to be machined must be fastened into chucks or tool heads, installation of pneumatic or hydraulic equipment has been made to eliminate the need for strong wrists, which many women lack.

A number of jobs would be more efficiently performed if good seating were provided, ventilation and lighting improved, and manual weight lifting eliminated.

All these modifications and many others may be suggested by the job analysis.

The analysis is also an invaluable guide to the interviewer, tester, and physician, in determining job fitness. It shows them at a glance what the requirements are, and consequently aids them in making their recommendations for placement. The examining physician should secure from the job specifications the physical exertion, finger dexterity, and special skills required; exposure to moving machinery or point-of-operation hazards involved; whether the job requires constant sitting or standing; if exposure to toxic dusts, fumes, gases, vapors, or mists is involved; the required vision; and whether the job must be performed in close cooperation with others. With this information and that gained from the physical examination, the physician can make invaluable recommendations for advantageous placement from the standpoint of health, safety, and production.

At least 4 of the yards visited, one a navy yard, prepared and used job analyses to aid in the selection and placement of women. The practice should be extended.

The application blank.

A carefully drawn application blank helps to simplify the selection procedure. It is of great assistance to the interviewer in conjunction with the job-analysis sheets, test results, and physical examination data. The blank should, above all, be easily filled out and, in addition to requiring the usual information such as name, address, age, education, training, work history, and the like, should save the interviewer's time by providing for addition of such data as marital status, number and ages of children, other dependents at home, permanent residence if from out of town, name and occupational status of husband, and expected mode of transportation to work. If no tests are given, it is desirable also to inquire about interests, hobbies, and special skills.

The extent of women's home responsibilities and the arrangements made to meet them should be ascertained, to judge whether or not they will be able to swing a job in industry in addition to their homemaking. It must be decided too whether their transportation problem can be met satisfactorily, and whether special arrangements must be made to place them on a particular shift to meet home or health needs. Inmigrants present still other problems. Since the application blank provides a permanent record, it is well to have these matters on paper, not only to help in selection and placement but to aid the personnel officers in assisting new women workers with their preliminary and permanent adjustments.

The preplacement physical examination.

Absolutely essential for adequate selection and placement of women in shipbuilding production is the preplacement physical examination. Many of the occupations now performed by women in the shipyards are physically demanding. It is important for this and the next generation that the ability of individual women employed to do such work has been properly assessed. The preplacement physical examination makes this possible. Not only does it prevent the employment of the few unable to meet shipyard demands at all or prevent placing someone on a job for which she is not physically suited, but in a positive way it makes possible placement of a worker on the job or kind of job that she can perform with greatest efficiency.

In addition, the preplacement examination reveals such communicable diseases as tuberculosis and syphilis. People with active pulmonary tuberculosis and with syphilis in its infectious stages are a hazard to others. It is important that the employment of such people be delayed until they have undergone treatment and a recheck shows that they will not infect their fellow workers. In three of the shipyards visited, applicants showing a positive Wassermann or active tuberculosis are sent immediately to the city clinic or to their own doctor for treatment; on evidence of continued doctor's care and control of the disease, they are placed. This is a socially and economically constructive procedure. One of

the shipyards visited, on the other hand, did not even give preplacement examinations though located in an area with an especially high death rate from tuberculosis and with high incidence of venereal disease. The health of many workers was endangered in this yard, not only because of contagion but by improper placement of those not in robust health; further, it was reported that, though needed, many women were loath to apply here for work under such conditions.

There are many other advantages of the preplacement examination. Though discussion regarding the special placement of a worker is based on the applicant's limitations and not on the basis for such limitations, the applicant herself should be advised of the presence both of remediable and of irremediable defects or impairments. In the first of these, impairments such as infected tonsils and bad teeth may soon disappear with prompt attention. Follow-up through the medical office to aid in rehabilitation is recommended. Such a policy promotes the health of employees, thus insuring continued working capacity and cutting down on absenteeism. In the case of irremediable defects, such as a cardiac condition, the applicant can be wisely placed and here also will be informed of the limitations of effort her defects impose. Thus she will be protected from injury and her fellow workers from possible accident; at the same time, she is employed where she may contribute most. Further, the great supply of marginal labor, comprising not only the physically handicapped but older persons as well, can thus be assimilated by the labor force and in work within their capabilities.

The preplacement physical examination makes possible complete utilization of labor. Recent surveys show that there are very few rejections, illustrating that the modern emphasis in the use of the examination is intelligent placement rather than escape from undue liability under the compensation laws. Thorough preplacement examination for all workers is strongly recommended by the United States Public Health Service, the Council on Industrial Health of the American Medical Association, in various of the States by the labor department or industrial commission, by the National Industrial Conference Board, the National Safety Council, and the United States Navy Department and Maritime Commission.[1] Any of these responsible groups may be consulted for advice and aid in organizing a suitable examination program for women in shipbuilding.

Such a program cannot be carried out without close cooperation among the workers, the unions, and management. This has already been achieved in thousands of industrial establishments, and especially in those employing 500 workers or more. It has been accomplished also in many of the shipyards. Of the 35 yards visited by representatives of the Women's Bureau that had women on production, 28 gave a preplacement physical examination to women

[1] See *Minimum Requirements for Safety and Industrial Health in Contract Shipyards.* Approved 1943 by the U. S. Navy Department and U. S. Maritime Commission, 35 pp.

workers. Almost all these gave the examination to men also, the approved practice. Sixteen had collective bargaining agreements, 6 with the AFL and 10 with the CIO.

It is earnestly recommended that the unions now preventing the introduction of the preplacement physical examination in certain shipyards reconsider their stand in the light of the facts and in accordance with their social responsibility. Let them consult with their affiliated organizations elsewhere that have cooperated in an examining program and discover the basis on which satisfactory agreements have been reached. In this connection it is important that the UAW-CIO has announced a 9-point program of health and safety clauses to be demanded in all its contracts. Among the main points are the following:

1. Free physical examinations must be given to all new employees before hiring and annually to each regular employee. The employee shall be given a copy of the physician's report.
2. No applicant shall be refused employment because of alleged ill health or disability if capable of performing an available job.

These raise the issue of the fundamental need for making certain that the physical examination will not be used as a method of exclusion rather than primarily as a means of good placement. One yard, for example, reported that it "will not employ anyone with any tendency to lung trouble." This is unnecessary and arbitrary policy. It should be clear also that the physical examination will not be used as a means of prejudicial selection, to refuse people active in the union, for example; that the manner in which the examination is given and the information is used will meet the highest professional standards; and that the applicant will be informed concerning causes for rejection, about physical defects that should be corrected and treated, and about irremediable defects and the limits they place on physical effort. The active cooperation of labor should be invited in setting up the program to aid in its proper organization, smooth operation, and most effective functioning.

Tests.

A large proportion of the women entering the shipyards lack industrial experience and even more have had no mechanical background of any kind. It is extremely difficult to evaluate the ability of these women to do the job, or to do one job better than another, merely from the data on their application blanks and reports of physical fitness from the physician. It is for this reason, as a matter of fact, that companies long employing large numbers of women have been pioneers in the development of aptitude and performance tests. Such tests have proved the only way of predicting with any accuracy whether a person without related work experience could do a particular job. Tests are given also with marked success to measure intelligence and to secure some objective indication of personality or individual characteristics that will affect adjustment to the job.

One of the shipyards visited reported high correlation between test results and successful placement. The company was using several mechanical aptitude tests, a tool-recognition test, a vocational test for industrial-training classification, and a quick-scoring mental-ability test. The management bases the fact that women have been successful and well accepted in the yard on the excellent selection made possible by means of tests.

It should be emphasized, however, that the use of tests is not without serious consequence if the proper precautions are not observed. Most important, the testing program must be set up and directed by someone trained and experienced in industrial testing techniques. Such a person knows how to choose the tests that will meet the needs of the particular company, can direct and control the experimental process through which tests must pass before their results can be accepted, and is acquainted with the dangers to which tests are liable and the misinterpretations that may be made of their results. This officer knows that tests, though not the sole basis for selection and placement, do provide important objective material to assist and illuminate the interviewer's appraisal of the applicant. Tests do not and cannot take the place of all other selective procedures, nor do they replace the personnel officer. Rather do they increase her effectiveness. It should be thoroughly understood, finally, that the selection or placement tests used and found satisfactory in one organization may not be equally or perhaps at all satisfactory in another. The properly selected officer for introducing the testing program will, of course, be well aware of these facts and also of how important are the conditions under which tests are given.

When properly standardized for validity and reliability in the particular firm and for the specific jobs to be filled, however, testing lends much greater accuracy to the total work of placement than can be secured by the other, more usually employed, methods alone. No matter how mature the judgment and shrewd the insight of the final interviewer, the results of a well-standardized and scientifically prepared and administered battery of tests add considerably to the reliability of her selection and placement activities. They are a check on educational background and on reported occupational experience. They aid the interviewer in comparing the candidate with the workers already on the job and, if the applicant is above or below the level of the group, help to indicate her capacities for more suitable placement. They show particular abilities or comprehension that are an aid to placement and can offer a clue as to temperament and personality characteristics that may be checked in the interview. This information is very helpful in placing women in manual labor or work that is dirty and disagreeable.

In view of the results, testing is an economical adjunct to the usual techniques of selection and placement. Tests are inexpensive to administer and score. Their cost is significant only in the first year of their introduction when the validity of each test is being determined.

Both technical and general information concerning how to introduce and use testing procedures may be secured from the selected references listed at the end of this section.

The interview.

The interview is usually the final and decisive stage in the hiring process. In most shipyards it is the only technique used. It should not be hasty. To the interview should be brought all possible background data for making careful selection and recommendation for permanent placement.

It is preferable in the shipyards especially, where so many inexperienced women are securing employment in an entirely alien field, that the interviewer be a woman. A woman is more successful in securing personal data that are essential to successful placement, and a woman is better able to present the work of the yard and the requirements of the job to another woman. She is more understanding of the interpretation and emphasis that are required in making women understand what will be expected of them and in putting them at ease with the new terminology and occupational alinement of shipbuilding.

The interviewer should be equipped with good knowledge of yard procedure and policies, detailed familiarity with the jobs to be filled, and ability to evaluate and interpret test scores. She should have a cordial manner, ability to establish and inspire confidence in the applicant, adaptability, and mature judgment. She must be capable of making the important selection and placement decisions with objectivity and in a relatively short time, basing such decisions on information secured from the application blank, the physician, and the testing program as well as on special information acquired during the interview.

It should be her duty to tell applicants about the available openings they can best fill, describing all phases of the work with some emphasis on the more difficult, less glamorous aspects. It is fully as important for the worker to take the job with complete realization of its drawbacks as for her to be fitted technically for it.

The interview should be held in privacy and the applicant should be given ample opportunity to talk freely and ask questions. It is during the interview that information should be secured and referral made to insure the care of young children and other dependents during the woman worker's employed hours. It is of course best not to employ women with children under 14 years of age when no permanent and acceptable plan for the care of the children has been made.

Selection and placement based only on the impressions of the applicant formed during the interview, with only the application blank as a guide, is somewhat of a risk. The findings of a thorough physical examination and the job analysis are the minimum accompaniments to the successful interview. Test scores are exceed-

ingly helpful. But, in addition, it is recommended that data secured in the interview itself be evaluated and recorded on a graduated rating scale of some kind that has been carefully devised.[2] This will lend a measure of objectivity to this most subjective yet practically universal selection technique.

Existing selection and placement techniques.

Though one of the most important phases of the woman-utilization program, few of the yards visited were doing a thorough and completely effective job in the selection and placement of women workers. Most of them employed no objective ratings, such as tests; the job analysis was a customary placement tool in very few of the yards; and even in those places where a physical examination was given, the results were not always used effectively, sometimes not at all, to aid in distribution of the woman work force. In many yards even the interview was cursory. A few of the yards, however, reported a thorough interview by a woman who attempted careful rating of the applicant. The same yards used job analyses in addition. When the physical examination was given, its results were employed in placement. These yards had made strides in labor utilization and were reaping the benefits.

In contrast, some yards were using the worst possible hiring methods. The results of such a policy as that described in the following report are poor efficiency, low production, depressed morale, and high turn-over:

> . . . the people were treated like a bunch of cattle at the hiring hall. . . . There was a battery of typists who stood at a counter and typed out a personnel card for each person, after the applicant had cleared with the union. No inquiry was made into the applicants' background, and they were merely hired by the wholesale for the particular craft in which there was a demand for workers on that particular day. As a result of this procedure, the women's personnel supervisor had encountered many women doing sweeping and other laboring work who had had factory experience qualifying them for much more skilled work.

The following is a report of equally poor technique:

> . . . the facilities at the employment office were very meager. There was a small porch with a roof over it. A number of windows opened onto this porch from the employment office and these were heavily screened. Persons being interviewed for jobs stood on this porch and talked to the interviewers through the screened windows. . . . If the women being interviewed and selected for work were interviewed in this same way it appears likely that results were not always the best.

Some of the obstacles to setting up sound selection and placement programs arise from insufficient coordination and cooperation of the shipyards and labor unions to that end. A number of problems need to be ironed out. These are suggestions for dealing with a few of them. For example, when the unions recruit workers for the yard, they should have a voice in setting up good standards of selection, but then should allow the final placement

[2] Help in doing this may be secured from the Psychological Corporation, listed among the selected references for this section.

to be done by the yard personnel office on the basis of those standards. The unions, in the interests of good labor relations and efficient labor utilization, should participate in and encourage better selection and placement techniques.

Where seniority is a factor in the allocation of jobs, the least agreeable and heaviest jobs ordinarily being apportioned to beginners, the lighter, cleaner, more skilled jobs to those with most seniority, a satisfactory policy should be devised by management and unions together so that women beginners unable to perform the heaviest work may skip a rung on the seniority ladder. Women could then be placed in jobs more suitable to their capacities without disrupting labor-management relations and with full understanding by all of the safeguards that have been set up.

It is important in yards with AFL agreements to facilitate transfer from one craft to another so that necessary reassignments can be made without penalty to the worker in the way of having to submit to a rehiring process and an additional initiation fee. When it is found that a woman is unsuitably assigned, transfer should be a simple procedure without cost or red tape. This is especially important, to cite the most obvious situations, in cases of industrial poisoning, pregnancy, or other physical handicap. In one of the west coast shipyards visited that had a closed-shop agreement with the AFL, some of the crafts already allow the transfer from one craft to another and either transfer their initiation fees or make some allowance on them.

Though Negroes comprise a significant proportion of the labor force in some of the large shipbuilding regions, comparatively few Negro women are employed in the shipyards except as laborers, sweepers, and cleaners. Of the 32 shipyards employing women operatives visited by representatives of the Women's Bureau and reporting on the race of employees, only 14 employed Negro women as production workers; these included 7 United States Navy Yards, 2 of which were in the South. Negro women should be selected and employed according to the same criteria as white women and should be given the same opportunity for training and upgrading. It is up to management with the aid of the unions to introduce the Negro workers in a manner that will overcome resistance and encourage maximum cooperation and production among white and Negro workers. It is notable that several of the shipyards visited were working Negro and white men and women together, side by side, with no apparent difficulty. Numbers of Negro women were welders or machine operators with helper and mechanic ratings.

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Occupations, published by National Vocational Guidance Association, Inc., 525 W. One Hundred and Twentieth St., New York, N. Y.

Personnel Journal, published by Personnel Research Federation, 60 E. Forty-second St., New York, N. Y.

Special conferences on employment psychology are held from time to time by the American Management Association (New York) and the Society of Industrial Engineers (Chicago).

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Consult also the United States Employment Service in your locality and the Bureau of Placement of the War Manpower Commission, Washington, D. C.

3. Employ women only in jobs found to be suitable.

The jobs women do well.

Practically the only shipyard jobs women held before the war were hand and machine sewing in the sail and flag lofts of 2 navy yards. In a third navy yard with a sail and flag loft even the sewing was done by men before August 1942. By July 1943 women held nearly 200 different jobs in the 7 navy yards and 28 commercial shipyards visited in which women were employed as wage earners.

Many women have already achieved full journeyman's status, some in a period of as little as a year. The majority of course are either in unskilled work or in helper classifications, but many of the latter are nevertheless doing skilled work independently. To mention but a few examples,[3] they are setting up and operating a variety of machine tools to close tolerance on short lots of work; cleaning, repairing, reassembling, and calibrating technical instruments; making from the templates without assistance such sheet-metal items as water tanks and ventilators.

[3] See the *Appendix* for brief description of other jobs women hold in the shipyards.

Numbers of women are already first-class arc welders and acetylene-burner operators whose work may take them anywhere in the yard or on the hulls and ships. A few are doing the entire job of making full-size wooden templates in the mold loft. Some women have achieved the rating of snapper, leadingman, and journeyman machinist. In fact, the plan of job progression in many shops calls for relieving the skilled workmen of more and more of the intricate work.



Official U. S. Navy photograph

Women at Work in Mold Loft of a Navy Yard. While One Girl at Right Reads Plan, Other Five Work on Bulkhead Templates.

The most common practical problem involved in employing women or new workers is the number of skills necessary to do a complete job. In yards engaged solely in new construction most jobs can be broken down into component parts and inexperienced men or women can be trained to do one or more of these parts in a comparatively short time. As they learn more operations they increase in skill until they can do many of the complete jobs independently.

This is not so easily accomplished in repair yards. The custom nature of the work demands a more general knowledge of craft fundamentals. However, many women are successfully employed in repair yards. In-service training courses are widely offered and some yards utilize the training programs given by outside organi-

zations. Women are taught to read blueprints, as the nature of much of the work makes this ability practically a necessity.

To aid in determining the jobs women do well, the table on pages vi-x at the beginning of this report is presented, showing the complement of women's production jobs in 35 shipyards employing women on production that were visited by the Women's Bureau in the period from January to August 1943. The jobs are distributed according to the shop or department in which they were performed or, in a few cases, according to the shop to which the women were assigned.[4] The jobs in which women were engaged on board ship or on hulls are given special attention. Occupations differentiated in the following ways are marked with the appropriate symbols: Those found infrequently X, those not recommended by the Women's Bureau as suitable except perhaps for women specially selected and specially qualified to meet unusual demands □, and those jobs only parts of which are recommended as being suitable for the average woman worker Δ.



Official U. S. Navy photograph

By Use of a Hydraulic Press, Four Women Electricians in a Navy Yard Bend a Conduit to Conform to the Curve of the Trench in Which It Is To Be Inserted.

Among the most common occupations for women in the shipyards at the present time are arc welding, gas burning (acetylene-burner operator), helping shipfitters, painting, tending toolcribs,

[4] In a very few instances workers hired for one shop—for example, crane operators assigned to the electrical shop—did their work in various other shops or departments, but these could not be differentiated.

operating machine tools, sheet-metal fabrication and assembly, and bench and assembly work, especially on electrical equipment.

The following tabulation shows the departmental distribution of women wage earners in 24 shipyards that reported numbers of women by department. Of special importance is the large proportion of women recorded as welding, burning, riveting, fabricating, drafting, and working in the mold loft as participants in shipfitting operations.

Distribution of Women Wage Earners by Department in 17 Commercial and 7 Navy Yards, 1943

(Women's Bureau survey)

Department	Women wage earners	
	Number	Percent
Total	28,097	100.0
Blacksmith and forge	60	0.2
Electrical [1]	2,855	10.2
Foundry and pattern	171	.6
Joiner, carpenter, shipwright	304	1.1
Machine [2]	4,090	14.6
Paint [3]	798	2.8
Pipe and copper	1,096	3.9
Print	15	.1
Rigger [4]	1,690	6.0
Sail and flag	1,031	3.7
Service and maintenance	2,700	9.6
Sheet metal	2,009	7.2
Shipfitting [5]	10,108	36.0
Toolroom	1,170	4.2

[1] Includes electrical manufacturing.
[2] Includes boiler.
[3] Includes paint manufacturing.
[4] Includes laborers and erectors.
[5] Includes welders, burners, riveters, mold loft, fabricating, drafting.

The Women's Bureau survey has revealed that employment of women in the shipyards went ahead most quickly in the fields where workers were most urgently needed, without due regard for meeting the requirements of the job with the properly qualified person. Furthermore, where masters in the navy yards or foremen in other yards were opposed to the employment of women, though their shops or departments may have been a logical entrance point, women were hired first to do other work not so suitable, to which, under good planning and labor relations, well-qualified men should have been transferred.

There is no longer any excuse for this, now that enough time has elapsed to prove women's effectiveness and to profit from hard-won experience. It should be clear from this experience in the shipyards and from comparison on the part of shipyard man-

agement with the long practice in other industries, what ship construction and repair work women can do best. It should be equally clear that it is wasteful of labor to hire women to fill jobs for which there is sufficiently objective reason to doubt their suitability.



Official U. S. Navy photograph

Electrical Workers Wiring Large Switchboard Panels for Ships.

More women should be hired to do electrical manufacture, assembly, and installation work, to operate machine tools and carry on bench and assembly work, and to carry through sheet-metal operations. Women can make the lighter cores in the foundry, can paint, and can work with cloth, canvas, and rope in the riggers'

shop and the sail and flag loft. They can clean shop and yard and help with the servicing and maintenance of yard and shop equipment. They give excellent service in the toolroom and can keep tools in proper condition. Their ability at lay-out in the fabrication department has been proved, and, given time, there is no limit to their capacity to succeed in the mold loft either as template makers or as loftsman helpers.

In fact, the extent to which women may be employed effectively in the inside shops is limited for the most part only by the time required to gain skill. Few of the jobs require heavy work for which movemen or handling and lifting devices have not already been provided, not especially for the women but for all the workers, to increase their efficiency and productivity. Women's employment should be extended inside the shops wherever possible and any men that are thereby displaced should be properly selected for other jobs in fields where the average woman is not so easily introduced.

To be sure, because of variations in types of work and in equipment and plant facilities, all shop work is by no means suitable for women any more than all work in the yard or on the hulls and ships. Some shop work is very heavy, as for example a few of the jobs on pipe and copper, some foundry and blacksmith work, and some fabricating jobs. On the other hand, to give but a few illustrations, certain types of electrical installation work on board ship, and welding and burning on flat platforms in the yard just a foot or so above the ground, are jobs women find easy to do.

In some yards, shops are open on one or more sides to the weather, to allow convenient hoisting of material in and out. In others, especially navy yards, a good deal of subassembly work is done completely under cover. In most yards, however, subassembly is performed on slabs or platens out of doors, exposed to wind, rain, heat, and cold. Consequently, there are instances in which work on the top decks of hulls is a good deal less demanding physically than work on major subassemblies in the yard.

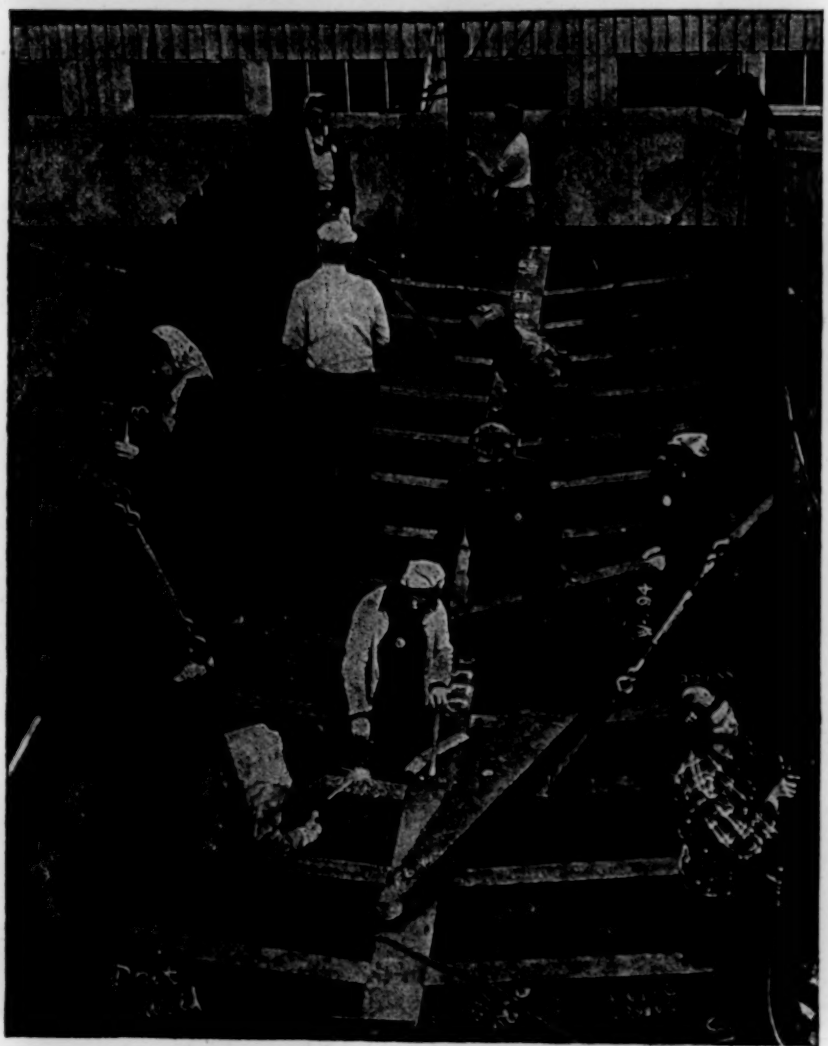
It is clear, then, that necessary generalizations made here concerning work on the platens or slabs and on the hulls and ships may not fit every case. The discussion and suggestions made, however, are appropriate in the large majority of cases.

Work on the platens and on the hulls and ships.

The differences between women and men as they affect capacity for doing various kinds of work must be taken into account realistically in evaluating the ability of the average woman to perform effectively certain jobs in a shipyard.

For example, it is important to the placement staff looking for workers to be employed on board ship that the frame of a woman is such that it is more difficult for her than for a man to maintain her balance; that a woman's blood has a higher water content than a man's and contains up to 20 percent fewer red corpuscles; that her heart beats about 8 times more a minute; and

her muscles, proportionately longer and thinner, allow her a squeeze only about three-fifths, and muscular strength only about one-half, that of the average man. Physiology shows, therefore, that a woman is not only less strong muscularly, but, because of the blood and heart difference, she tends to tire more quickly than a man. Besides these considerations, persons responsible for placement will want to take into account that women's average height is 5 inches less than that of men; their reach is less; their



Official U. S. Navy photograph

Members of an All-Woman Crew Aiding Men at Work on a New Destroyer Escort.

fingers and hands are smaller; and because they are more likely to get varicose veins and tire more quickly, constant standing is more difficult and harmful for them.

Much of the work in the yard on slabs or platens to some extent, but especially on the hulls and on board ship, requires constant standing and climbing and walking about where footing is precarious. It requires carrying loads while climbing; holding tools and equipment while working on scaffolding; climbing down through hatches and using ladders between decks; bending, crouching, and kneeling in confined places. Such activity is not only hazardous for the average woman, but it is fatiguing, and is accompanied frequently by circumstances that in themselves add to the strain of the work; for example, the confusion of hose, cable, and other equipment lying about, workmen swarming everywhere, the din from chipping, scaling, and riveting, and exposure to extremes in the weather.

For the most part, the work that women are doing under these conditions is in itself suitable. Women make good welders, burners, and helpers for shipfitters, sheet-metal workers, and electricians. This is the work that most women employed on the platens, the hulls, and on board ship are doing. The question here is not the work, but the conditions under which it is performed. These conditions require steady nerves, good health, strength, endurance, and unusual ability to move quickly, nimbly, and easily under fairly heavy burdens and in awkward places. The average woman cannot meet these conditions with the same degree of efficiency as the average man.

It is essential, therefore, that when women must be employed for work on the platens under conditions described above, or on the hulls or ships, certain precautions be taken:

1. The women should be selected carefully on the basis of a thorough physical examination and complete employment interview, so that those unable to withstand or adjust to the physical and emotional strains imposed by the conditions of work may be employed on other work.

2. Special orientation for work on board ship should be provided in addition to the usual shipyard induction.

   One yard was already making plans to install such a program at the time of the Women's Bureau visit. In Oakland, Calif., furthermore, a vocational school cooperating with a large woman-employing drydock is providing such preplacement introduction to the work environment as conditioning exercises and training in how to climb ladders and work on scaffolding. Women are given short periods of training in several jobs under simulated working conditions. In this way each woman's aptitude and her reaction to operational factors is determined as a basis for placement. The woman herself is allowed to choose the craft that seems most to her liking.

3. Supervision of women should be much closer under the more severe and unusual environmental conditions of work on board ship or on the hulls. It should include special attention to safety and fatigue factors.

Employing women to work on the hulls or on board ship involves still another problem, besides that of the limitation in strength and stamina of the average woman to meet the unusual circumstances. That is the problem of maintaining good work conduct under the special conditions imposed. Among these conditions is the large amount of independent activity of the workers on the ships and hulls whereby one or two people may be required to attend to a welding, shipfitting, or installation job in an isolated place. Often groups must wait around for a part of an operation to be finished before they can get to work on their section of it, thereby giving them time and opportunity for social gathering.

To be sure, by no means all the yards visited employing women on the ships feared or mentioned a so-called "moral problem." In some yards the question appeared never to have come up; in others it was a matter of much concern, though no more grounds for this were evident than exist in any office or industrial establishment where men and women have been working together without serious incident for years. There need be no problem in the shipyards if certain conditions are met:

1. The women selected to work on board ship or on the hulls and docks and even in the yard on the platens should be mature individuals with a conscientious attitude toward work. They should be specially selected for these attributes as well as for strength, agility, and physical well-being.

2. Whenever possible, women should be assigned to work in groups.

3. The more careful supervision of women already mentioned in connection with work on the platens and on the ships and hulls should guarantee also good allocation of work so that there is as little waiting as possible.

4. A woman counselor should be available on each ship or in the various sections of a ship where a significant number of women are working. In this way problems peculiar to work on the ships may be attended to immediately on their arising and ways of preventing them in the future can be ascertained and put into effect. The women counselors so assigned should be free to cross craft lines in the interests of economy and efficiency.[5]

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[5] See discussion of the duties of women counselors, pp. 40 to 48.

Occupations only partially suitable for women.

By reason of the strength required to do parts of certain occupations, the average woman is capable of performing efficiently on only one segment of some jobs or on the whole job while using the lighter materials. Usually in such cases, physical strength is the only criterion outside of the factors mentioned in connection with some work on platens, and on ships or hulls, for determining how much of the work a woman can do. Thus, women nibbler, bending-roll, brake-machine, flanging-press, and power-shear operators for the most part operate the levers or automatic stops on the machines and ordinarily, if they have anything at all to do with feeding the metal into the machines, they act only as helpers. When they feed the machines as well as operate them, their activities in this regard are limited by the weight of the pieces or by the ease with which available mechanical handling equipment can be used. Furnace tending is in about the same category.

The amount of helpers' work that women can do, especially on the hulls, is limited also by the weight and size of materials to be handled. This is true more of shipfitter and sheet-metal-worker helpers than of electrician helpers. The job of helping crane riggers too is only partially suitable for women because of the extensive climbing necessary, the weight lifting involved, and the degree of strength needed to fasten snorters and slings to materials. Women can help and are helping, however, where only moderate lifting, and not undue exertion, is necessary. It is recommended [6] that special attention be paid to teaching women how to lift weights and that all jobs for women in which the question of weight lifting is involved be specifically investigated to determine the maximum weight, height, and frequency of lift that shall be allowed the women employed for the job, and the provision that should be made for rest pauses.

Coremaking has been a woman's job for many years, but women have been making only the lighter cores. The large cores require considerable strength to lift and handle. Women cannot work on these successfully unless good provision has been made for easy handling and this is not often done.

Some ship and tank cleaning, especially the work that involves hauling heavy buckets of material and using a wire brush or scaling gun, is too heavy for the average woman, though most shop and yard cleaning ordinarily is suitable for women.

Very little ship riveting and bucking-up can be recommended as a good job for women. Most of the rivets are large and the steel plates are thick and heavy. Riveting under such conditions requires considerable strength and endurance besides the stamina for withstanding the deafening noise and penetrating vibration. It is even questionable whether for sustained production women are the best choice for the lightest riveting on steel, though the type of riveting and bucking-up done on sheet metal appears suitable.

[6] See p. 53.

Occupations of questionable suitability for women.

For any job, no matter what its nature, the best criterion for good placement is not one of sex but of the individual's ability to do the work successfully and without injury under the conditions imposed. There are, for example, many men less capable of performing arduous or hazardous work than many women.

However, when consideration is given to the differences between men and women that affect the average individual's ability to do a job well and adjust to its conditions, it becomes obvious that there are certain occupations in shipbuilding for which only the exceptional woman and even the above-average man can qualify. And there are some others for which it is questionable whether any woman should be employed because the risk of injury is greater for a woman than for a man.

Jobs in the category first named that should be mentioned here are steel bucking-up, calking, heavy bus and truck driving, and heavy and dirty ship and tank cleaning. In the last of these the problem in finding a woman worker derives not only from the heavy nature of the work but from the exceptionally unpleasant conditions under which it is performed. It necessitates crawling down into the holds of ships and going inside the large tanks. Water and refuse are everywhere, and, in addition, a tangle of hose and other equipment. It was said in one report of ship cleaning that "it is so unpleasant that workers are kept inside only two hours at a time and after two days are changed to another job. Some workers get panicky." The psychological or emotional factors involved cannot be overlooked. Though many women in industry have for years been doing heavy and disagreeable work without serious effects, women, by and large, are spared the heavy and dirty work in industry as a matter of American custom. Many women, because of tradition, look askance at such work and find it even more difficult to adjust to its conditions than to meet its physical demands.

The occupations in shipbuilding for which it is questionable whether any woman should be employed are those requiring the use on steel of sandblasting equipment or other pneumatic tools such as the riveting gun, power brush, scaling and chipping hammer, and the pneumatic drill. Operation of these tools in the shipyards, and especially the use of the larger and heavier models, involves risk to any worker, man or woman. Among the pathological conditions that may and do result are vascular disturbances and injuries to the joints. In the first of these a local anemia of the hand supporting the tool occurs, making the hand stiff and awkward and unfit for work. This condition, which may affect only the fingers or finger tips, is known as "dead fingers" and is attributed to the shock and vibration of the pneumatic tool acting on the blood vessels and nerve trunks. At the end of an attack the fingers suffer from a burning sensation. "Dead fingers" is of frequent occurrence and is especially prevalent in cold weather. It is most likely to affect workers who, like the women only lately

introduced into the shipyards, have not yet acquired skill in manipulating tools. Injuries to the joints are much less common, but when they do occur they tend to be more serious and are frequently permanent in character. They include such conditions as necrosis, chondromatosis, arthritis, osteochondritis, and bone cysts. The elbow and especially the arm holding the tool are most frequently affected. When the pneumatic tool is held in an unnatural position, other locations of injury, such as the hip, are found.

To be mentioned also among known possible effects from using pneumatic equipment are hardness of hearing and deafness brought on by the excessive noise that accompanies the operation, and silicosis, pneumonia, or other dust-produced illness that may occur when inadequate precautions are taken against the dust that commonly attends the work. The effects of noise and vibration on the nervous system are less well known but may be equally serious.

Few data of a reliable sort are available at present showing conclusively that women's reactions to work with pneumatic equipment are different or more serious or pronounced than men's. This is because women have not used such tools in the past to any extent and those who are operating them now have been doing so for only a relatively short time. Little objective evidence exists also because inadequate attention has been paid to watching women's progress and performance in the work and studying and reporting on their medical history. However, from knowledge of the operations and of women's physiology and pathology, a group of medical authorities consulted by the Women's Bureau [7] agree that no women with menstrual difficulty or with a history or clinical diagnosis of pelvic disorder, especially pelvic congestion, should use vibratory equipment even of the rotary type. They recommend also that pneumatic tools should not be used by pregnant women, by women who have had repeated pregnancies or abdominal operations, or by women with unusually large breasts. Furthermore, it is advised that even women without any of the complications mentioned be kept from operating the heavier pneumatic tools.

When any pneumatic tools at all are used by women, certain conditions should prevail. First, the women chosen should be above average in stature and muscular development and of the phlegmatic, hypothyroid type. Second, though a sitting posture is preferable to upright posture, if standing is necessary it is advantageous if rest periods are taken in the prone or knee-chest position. Third, women should not brace their tool against the chest, since such practice may aggravate the tendency among women to develop cancer in the breast.

For all pneumatic-tool operators it is essential that a preplace-

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[7] Dr. Philip Drinker, Chief Health Consultant, U. S. Maritime Commission; Dr. Leonard Greenburg, Executive Director, New York Division of Industrial Hygiene; Dr. Alice Hamilton, Medical Consultant for the U. S. Department of Labor; Dr. M. H. Kronenberg, Chief, Illinois Division of Industrial Hygiene.

ment physical examination be given to bar from the work anyone with symptoms of constitutional arthritis and anyone unable to withstand the rigors of the job—the torque, vibration, noise, heights, and so forth. Periodic examination is necessary and should include X-ray, particularly of the elbow, to detect changes in bony structure. Those showing vasomoter disturbances, nervous or arthritic changes, or signs of respiratory disturbance should be transferred to other work. Rest periods are important, as well as a reduction in the hours at which the operator continues to use the tool, perhaps by means of a change in job from time to time. The escape of air should be from the front, not the side, of the tools and the air pressure should be as low as possible. Counterbalance, suspension, or propping of the tool should be introduced whenever possible to relieve the operator of the weight and vibration. In all cases the worker should be taught the best method of holding and maintaining the tool in position. Wherever dust is a factor, as in sandblasting, wirebrushing, scaling, and chipping operations, every precaution should be taken in the way of good ventilation and exhaust equipment to prevent the contraction of respiratory disease.

Where women have been employed to operate pneumatic tools in shipyards, indications are that adequate attention has not always been given to protecting the operators and making the operations as safe as possible. Even the general precautions recommended above to be taken for all pneumatic-tool operators are not being observed, much less those that apply specifically to women. For example, in one yard women were using wire brushes varying in size from 2 to 15 pounds. They were wire-brushing in the holds of the ships and yet no blowers were supplied to draw off the dust and metal particles. In addition, not all the women workers were wearing respirators and goggles, equipment that is absolutely necessary for safety in this work.

Though in another yard a woman using a 15-pound chipping gun had lost 20 pounds in weight since being put on this work, and was developing tenosynovitis (an inflammation of the tendons), she would have remained at the job had not a woman counselor happened on the case by chance. Only then were the three other women operating chipping guns in this yard examined. They were judged husky enough to stand the work, but it is hoped that examinations will be given them periodically so that they may be transferred should any ill effects develop.

Another instance should be cited, that of women operating large portable pneumatic drills. The drills were so large and the torque so great during the operation of drilling holes in the bands on the outside of torpedo tubes, that three women were engaged in this work instead of the two men previously employed. The drills could not be held low, in line with the pelvis, as they should have been, but because of their size had to be held breast high, braced against the chest. Furthermore, small and slight women instead of women who could more easily stand it were chosen for the job because the same women had to crawl into the tubes to counter-

sink the holes from the inside. This is a clear case of serious error in placement.

If women must be employed in occupations about which there is such grave question of suitability, it is inexcusable to employ them under conditions of haphazard selection and placement and inadequate precaution for their protection on the job. The safety and health divisions, with the cooperation of the work supervisors and women counselors, should give the women workers in such occupations their most careful and continued attention and should make those jobs as well as any others that involve hazard as free from hazard as is possible under the circumstances.[8]

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4. Pay women and upgrade them on the same basis as men.

Entrance rates.

The principle of "equal pay" for women has been gaining in strength[9]. In this wartime period many thousands of women are

[8] See especially *Minimum Requirements for Safety and Industrial Health in Contract Shipyards,* issued by the U. S. Navy Department and U. S. Maritime Commission in 1943, 35 pp.

[9] See *"Equal Pay" for Women in War Industries.* Bulletin 196 of the Women's Bureau, Washington, D. C. 1942. 26 pp.

in the type of jobs men formerly held and are receiving the same rate. This is the policy recommended by the Women's Bureau, and it is followed, by and large, in the shipbuilding industry as far as the entrance rate is concerned.

It is significant, however, that this has not been true in each of the navy yards. The Assistant Secretary of the Navy, in a circular letter dated August 28, 1942, when few women were yet employed, emphasized the principle of "equal compensation for equal work irrespective of sex." This principle has in general been followed, but inequity has crept into some of the yards by way of the hiring rates, probably because of the unequal supply of men and women in the area and the desire to draw as many men as possible.

Thus, in one yard at the time of survey, all women, regardless of previous experience, were hired as "mechanic learners" at 58 cents an hour, whereas men with no experience were taken on as "classified laborers" at 74 cents. A woman who had worked for 6 months as a drill-press operator in a war plant was hired to do drill-press work at 58 cents, whereas a man with similar background was given the third-class helper's rate of 77 cents. To be sure, the woman was eligible for speedy upgrading into the helper's classification, but by the time she reached that class the man would be one or more steps ahead. She had to prove herself; a man offering similar qualifications did not.

In another navy yard all women were taken on as "mechanic learners" or "classified laborers," the former to learn a trade and advance, the latter (with few exceptions) to remain in laboring work. Men, on the other hand, were engaged from the start on the same or similar work as helpers and all had the opportunity to receive training in a trade. Therefore, though the women "mechanic learners" were upgraded with fair speed, men hired at the same time for the same work remained several steps ahead, though they may originally have submitted no additional qualifications.

It is urgently recommended to the navy yards that the entrance rate for workers who have neither previous work experience nor training be the same for men and women, and that any variation in such rate be based on the job. If women are hired as "mechanic learners," men with the same qualifications also should be so hired. When men or boys cannot be secured at the rate for "mechanic learners," women beginners should be taken on at the higher rate offered men beginners.

It is recognized, of course, that many if not most of the women now employed in the shipyards will not remain after the war. This is true also of a large, but not equally large, proportion of the men. Certainty of such a future situation does not preclude equitable wage-setting now. Every effort to avoid break-down and inconsistency in present wage standards makes fewer the wage problems that will arise and require adjustment in the future. It should be borne in mind that if one group is paid arbitrarily a lower rate than another group for the same work, the

group first named is free to underbid the one better paid and thereby to depress wages in a period of an expanding labor market.

Upgrading.

The Women's Bureau survey of 35 shipyards employing nearly 61,000 women indicates that discrimination is common when it comes to upgrading women or to giving an upgraded woman the rate for the job. Except for the trade of electric arc welding, case after case could be cited either of women working as group leaders or skilled craftsmen with only helper's ratings, or of resistance on the part of foremen, management, or the unions to allowing women equal opportunity with men for supplementary training, upgrading, and supervisory work.

This situation arises in large part from a very real problem, that of alarm over the break-down under war conditions of the apprenticeship system. Before the war, mechanics in the shipyard trades usually reached full journeyman's status only after passing through 3, 4 or even 5 years of training in class and on the job. During this apprenticeship period they were to have mastered their trade in thorough all-round fashion and become eligible for maximum pay as first-class skilled mechanics.

The needs of the war emergency, however, have made it necessary to introduce literally thousands of inexperienced men and women into the waterfront and shop trades without ceremony and with speed. Many of the experienced mechanics have been rapidly upgraded to assume supervisory duties, while the new workers have been pushed through relatively short training courses and after a year or a year and a half, with regular upgrading, are at top grades and rates. Consequently, they are getting the same pay as the skilled journeymen who have taken special long-term training and ordinarily can do a much greater variety of work. If there has been resentment on the part of the seasoned workers, foremen, and the unions about the men who, though "upstarts," may at least have had industrial experience of some kind, the feeling has been even stronger toward the women who in most cases are completely new to industry. The "90-day wonders" of the shipyard trades are viewed with alarm as a serious threat to status and job security.

Yet the new workers, men and women, have been building ships and doing a good job. The amazing tonnage produced since Pearl Harbor could not have been turned out without them; much more will have to be built before the war is won. The question is, what constitutes fair promotion policy and equitable rate setting in their case?

Most of the new men, women, and boys who have only lately been introduced to the shipyard trades cannot achieve, under the specialized training many are given and the necessary dilution practiced, the all-round proficiency of the old-time mechanic. In the inside machine shop of some of the navy yards one solution

has been the utilization of an intermediate grade called machine operator. This classification covers jobs requiring an employee more skilled than a helper but not so skilled as a mechanic. It is especially appropriate for much of the work men and women newcomers are learning to do. For example, the turret-lathe department of the inside machine shop in one of the navy yards has lately been employing over 300 women as lathe operators. These women are doing a fairly skilled job, but obviously they are not full mechanics. They are given the rating of machine operator as they qualify. If given further training these workers should eventually achieve mechanic's status.

Supplementary training for upgrading into the journeyman classification for workers other than welders and burners is given in the navy yards and some women are enrolled. To make maximum use of the woman labor force, it is essential that every woman capable of doing a skilled job be encouraged to enter such training in any of the fields open to men that appeal to her. Classifications such as "machine operator" then would apply only to those who are upgraded into and remain in diluted or specialized jobs and who do not want to or have not the ability to acquire further, more rounded experience and instruction.

The difficult problem of upgrading in the private yards is complicated by the many classification systems used and variations in union agreements where they exist. Progress is now being made, as a result of recent Coast agreements, toward establishing wage brackets for the first 3 classes of helper and for laborer as well as for journeyman. This will help to make possible more uniform policies of upgrading women workers, most of whom are in the laborer and helper status.

There has been little resistance to accepting women into full journeyman status in the electric-arc-welding trade. The secret of this situation lies, first, in the fact that welders predominate among the kinds of skilled workers of whom there now is serious shortage in the shipyards; and, second, that for ship welding there is an objective and standard performance test, preparation for which does not ordinarily require more than a few months of training and experience on the job. The test is given under the supervision of a representative of the Navy, and the size of the testing specimen and procedure for obtaining it are prescribed by the Navy. Many yards give full first-class journeyman's wage and status immediately or shortly thereafter to those who pass the Navy test. Thus, acquiring the journeyman's classification in the case of welding does not depend on the qualitative judgment of a work supervisor nor does it require the diversity of information and skill needed for some other trades that can be learned only after many months on the job. But actually women have also proved their mettle in welding. In a significant number of yards women welders comprise as much as a fourth or more of all the women on production.

This is not to say that women are attaining journeyman's rates only in the welding trade, but that the acceptance of women as

journeymen in that trade is more general and their progress in it is speedier. As a matter of fact, some women have already achieved skilled burner, craneman, painter, pipe covering, and shipfitter ratings. There will be others.

In some places and especially on the west coast, the exigencies of a very tight labor market have made it necessary to upgrade inexperienced men and women much more quickly than elsewhere to get the work done, to prevent turn-over, and to compete with other industries for workers. In such cases, those receiving the skilled rating after less than the usual time are accepted by one of the unions only as specialists and not as mechanics. In one yard, inexperienced workers are called "special apprentices," to distinguish them from the regular apprentices, but both groups may achieve journeyman's pay. One union was not giving people cards as journeymen till they had had 5 years of experience, though they now may reach the journeyman's rate long before that.

These are safeguards set up to protect the apprenticeship system and more or less to regularize trade standards that doubtless will come back into their own after the war. Good trade standards can and should be preserved, but it is recommended strongly that there be no discrimination in so doing. Every effort should be made to avoid the situation frequently found, that of women acting as snapper, as group leader, crane operator, spray painter, and the like, without recognition in either wage rate or title. Such a situation is not only unjust; it is damaging to morale and therefore to optimum performance.

5. *Schedule an 8-hour day and a 48-hour 6-day week; allow a lunch period of at least 30 minutes, and rest periods of 10 to 15 minutes in each work spell of 4 hours. Rotate shifts no more frequently than every two months.*

Years of study and experiment indicate that if certain standards regarding hours, work shifts, and rest and lunch periods are observed, women workers are more likely to give their best performance. These standards, recommended for sustained efficiency in wartime shipbuilding, follow.

Hours.

Hours not in excess of 8 a day and 48 a week are recommended; also not less than 1 day of rest in 7.

Though both the Navy Department and the Maritime Commission are among the eight United States Government agencies that strongly recommend an 8-hour day, a 48-hour and 6-day week, for maximum and sustained production, a good many of the shipyards are not complying. About a third (11) of the 35 shipyards visited that employed women had a regular weekly schedule averaging longer than 48 hours. In one the workweek was 60 hours for

women. Five yards had a 9- or 10-hour day. Three provided no day of rest and in three others there were extended periods when this was true, women being obliged to work week in and week out with no break. In addition, at least 11 yards with scheduled hours of 48 or less required overtime above the schedule from time to time, in some cases frequently and for long periods.

The data available indicate that the efficiency of the shipyard workers cannot be maintained under long work schedules; that such schedules do not solve the problem of production, and yet they are costly because of the time-and-a-half and double-time overtime pay.

Results of studies relating to hours of work, fatigue, and output in other industries also are not without significance in shipbuilding. Several of such studies are among the references at the end of this section or are described there. They show in general that under most conditions women's optimum schedule is below men's, and that in production not controlled by the speed of a machine, hourly output rises with reduction in hours of work to approximately 8 a day. All available sources indicate that at least 1 day of rest in 7 is essential to productive efficiency.

There are several reasons why long hourly schedules and overtime are in practice in the shipyards in the face of evidence against their efficiency. Two are especially important.

First, in some cases a sufficient number of skilled workers cannot be secured to man a third shift effectively, and a compromise of two long shifts is made. It is significant in this connection that in one of the yards visited by Women's Bureau field representatives where the scheduled hours had recently been changed from 10 to 8, the management stated that the efficiency of all the workers had materially increased since the adoption of a shorter workday.

Second, longer hours and overtime are, of course, a concealed means of increasing employees' pay and thus competing with other shipyards or war industries for labor. This situation is difficult to meet except by firm insistence of the Navy and Maritime Commission and agreement on the part of all yards that the 48-hour week be maintained without overtime except in bona fide emergencies. The Maritime Commission issued orders early in 1943 and again in December that official hours be cut from 10 to 8 a day, yet it was found in the yards of one area of the South Atlantic that permission was asked frequently by management and granted by the Maritime Commission for thousands to work on Sunday. On the Sunday preceding the field representative's visit, overtime had been granted for several thousand workers in one yard alone. A neighboring yard under Navy contract attributed its 10-hour day and 60-hour week to the need for holding its workers in competition with the Maritime Commission yards, supposedly on an 8-hour day and 48-hour week.

There is danger that by setting the pace too high now, the available human energies will peter out before the home stretch. Women especially are handicapped under the pressure of long

hours, since they not only suffer fatigue from the work itself, but the fatigue may become chronic, and anxiety result as well from having to plan meals, shop, clean house, pay bills, arrange for the care of children and so on in the all-too-few hours left them after work. Under heavy work schedules, homemakers will be absentees much more frequently than when employed within the recommended workday and workweek. More and more married women are entering the shipyards. These women are needed to take the place of men who leave for the armed services, so the question of hours becomes increasingly acute. It is by far the better policy to place and keep women initially on a schedule that is good for the long stretch, thereby promoting their efficiency as workers, insuring their regular attendance, and making certain of their sustained energy for building ships through the war period and remaining healthy citizens afterward.

Lunch period.

A lunch period of at least 30 minutes in the middle of each shift should be allowed.

If 30 minutes is too short a time in which to leave the workplace, wash, and secure and eat a hot and well-balanced meal, the lunch period should be lengthened or the food service and facilities should be extended. A few shipyards have been using mobile canteens very successfully as a supplement to central cafeterias to send and dispense food to remote parts of the yard. In this way, employees on the hulls and ships may secure proper nourishment in the minimum of time.

More than two-fifths of the women on production work in the shipyards visited had 30 minutes for lunch. A few had as much as 45 minutes or an hour. At least a third, however, had but 15, 20, or 25 minutes, though few of the yards with short lunch periods had facilities that would provide adequate service and hot food in the limited time assigned. Many did not maintain facilities that were adequate even for a 30-minute period.[10]

Night work.

Night work should be required of women only as an emergency measure; and when it is necessary, all possible steps should be taken to protect the night workers' health and foster their efficiency and morale.

Night work should be assigned only after careful investigation to make sure that the woman worker's health will not be endangered thereby and that her transportation situation and home responsibilities are such that work on such shifts will not bring about undue hardship.[11]

It is advisable that employees having a history of anemia,

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[10] See pp. 59 to 66 for discussion of food service and facilities.
[11] See p. 16 for statement regarding seniority arrangements.

respiratory disease, digestive disease, or nervous disorder be not assigned to a night shift. Results of the physical preplacement examination will be of service, therefore, in making assignments to shifts. Since loss of regular sleep is more serious for young workers who have not attained full growth, girls under 20 should not be placed on a night shift. Convenient transportation should be available at the time of shift change. The yard may have to provide transportation if the public utilities cannot maintain service to the extent or at the times required.

The personnel counselor or interviewer should ascertain early, before assignment to shift has been made, that problems of home management will not interfere with the woman's ability to maintain efficiency on the night shifts or that work on the night shifts will not interfere with her essential home responsibilities. Actually women with heavy duties at home should be discouraged from night work, since performance of these duties during the day makes women tired before their shift so much as starts. Continuous employment at night under such circumstances leads inevitably to chronic fatigue.

Facilities provided for the night shifts should equal if not surpass those available during the day because night work is more demanding on the individual. It should be possible to secure a hot and nutritious meal in the middle of the shift; the hours and day-of-rest standards should be preserved; medical, safety, and work supervision should be completely adequate; lighting should be well planned and distributed. These conditions are important, yet in many of the shipyards facilities were less adequate at night than during the day. In certain yards this was especially true of food facilities.

Rotation of shifts.

Shift rotation is recommended to distribute the burden of night work and to avoid the chronic fatigue that sets in after a long period of employment on night shifts.

Night workers seldom get sufficient sleep during the day, and consequently their health is undermined if they are placed permanently on night schedules. Yet most of the shipyards visited did not provide for rotation of shifts. In two of the yards with permanent shift schedules as many as 15 percent and 17 percent of the women employees were on the graveyard shift.

Shift rotation should not be so frequent as every 2 or 3 weeks, thus making it difficult to adjust eating and sleeping habits, nor at intervals so long as to develop chronic fatigue. A period of from 2 to 3 months on either of the night shifts is within the limits most frequently recommended by health authorities and found most satisfactory in the experience of women workers. Rotation on such a schedule was being practiced with satisfactory results in 3 of the shipyards visited by Women's Bureau representatives.

Rest periods.

A period of 10 or 15 minutes in each work spell of 4 hours should be set aside for pause and relaxation.

Women tire more quickly than men, but their energy is renewed more rapidly. Wherever women are employed, therefore, the regular rest pause is particularly effective for maintaining the speed and quality of production. The pick-up after a few minutes of rest away from the workplace preserves and even heightens the rate of production, prevents accidents and spoilage, and promotes the health and efficiency of the worker. Objective studies have proved the efficiency of the official rest period even when the work is intermittent, necessitating pauses in routine.

Women's work in the machine, sheet-metal, electrical, pipe and copper, and other inside shops in the shipyards is similar to the work women are doing and have done for years in other industries where rest periods already have proved their value to management and the worker. Welding, burning, the various jobs under the general heading of shipfitter's helper, and some others performed on the platens, hulls and ships are, on the other hand, new for women, so there is no consistent evidence for or against the efficacy of rest pauses for women in this work. However, because these are jobs whose continuity of performance depends largely on the rate at which co-workers in related jobs may proceed, and thus work is intermittent, it is generally assumed by management that regular official rest periods are unnecessary. It should nevertheless be emphasized here that even though the nature of the process and the jobs do not require continuous activity, the workers engaged in them must be constantly on the alert for their assignments, and must in many cases remain in uncomfortable workplaces where seats are not available, and in an environment of noise and confusion. If they are in the yard, on the slabs or platens, or on the hulls, many are exposed throughout their waiting as well as their working time to extremes of weather—to dampness, cold, and heat. The official rest period allows them to take as their right some minutes of respite from their work and work environment.

It is not necessary that all the women leave work at once, for the rest pauses may be staggered. Nor is it necessary that any one group stop at exactly the same time each day. Such matters can be arranged to accommodate the work situation. The important thing is that over and above necessary personal time out, a period of time be provided each woman worker exclusively for rest and relaxation. In many factories rest periods are granted to all employees, men as well as women.

If in this pause the women rest, smoke, take a snack to eat, go where they may warm themselves in the winter and cool off in the summer, they will return to their jobs refreshed. When regular and official rest pauses are provided to those whose work is neither continuous nor routine, as well as to those whose work is continuous and routine, there are indications that not only is less personal

time taken, but the benefit derived is greater than that experienced from informal rests of short duration now and then, either surreptitiously or openly as needed.

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6. Set up an effective woman employee counselor system.

Employment of large numbers of women with no previous shop experience at a time when foremen are overwhelmed with production problems necessitates the development of a group of women personnel workers who can initiate women unaccustomed to industrial work into the complexities of the shipyard and assist shop supervisors with the problems that arise through their employment.

Of the 35 yards employing women on production and visited by Women's Bureau representatives, all but 9 had women per-

sonnel workers in some capacity. Five of the 9, unfortunately, employed each between 700 and 2,200 women wage earners and were sorely in need of more adequate attention to women's problems for the sake of raising morale and increasing production. One was conspicuous for the poor spirit of its workers and for deplorable working conditions, features usually found together. The yard's reputation caused reluctance on the part of the women in the town to heed the call for workers. Consequently, many of the women taken on came from out of town, complicating community and management problems immeasurably and leading to the employment of women who ordinarily would be unacceptable. A good many of the shipyard's difficulties might not have arisen had adequate selection of women been made at the outset and their adjustment and supervision been placed under the direction of a capable head of women's personnel. A belated effort was being made at time of visit (February 1943) to find a woman to accept the post. Since that time a woman interviewer and a counselor have come to the yard and already have been able to do a great deal to benefit the selection and adjustment of women workers. But their job has been extremely difficult because of the poor beginning.

The women's personnel divisions in active operation in other yards varied considerably from yard to yard, differing chiefly in the freedom from rein and the well defined authority given the women counselors and the approach to the personnel function, whether administrative and positive or disciplinary and negative. Only a few effective plans were in force at the time of visit by Women's Bureau representatives. Two were in United States Navy Yards. One of these was organized late in 1942, but another was set up in response to a circular letter issued in May 1943 by the Assistant Secretary of the Navy establishing the positions of "personnel assistants" for women shop employees in Naval Shore Establishments. The positions were set up in 4 grades, beginning with Junior Personnel Assistant at a $2,000 annual salary and allowing at the top for a Principal Personnel Assistant at $3,200.

Actually, the size and lay-out of the yards and the extent of women's employment influenced the plan of the counseling system and the functions of women personnel officers. Whatever the set-up and functions, the counselors' status should be well defined. Job supervisors and union representatives should be consulted when delimiting and outlining their functions, and all the workers, men and women, should understand them thoroughly.

Because of their full-time attention to the special needs of women workers, the women personnel counselors can be of particular assistance not only to job supervisors but to shop stewards. It is important that both work closely with the counselors and use the service they can render the better to increase their own effectiveness and to give the women workers greater opportunity for good adjustment.

Experience has indicated that an effective employee-counseling system requires a head of women's personnel who works within

the main personnel or industrial relations office. In a yard employing as many as 500 or more women, the head of women's personnel should have under her women assistants who work directly with the women and production supervisors or masters in the shops. These assistants should have desks in the shops to which they are appointed. In most yards it is best that at least one woman assistant be assigned to every shop where women are employed to a significant extent. In some yards there may be shops requiring several such assistants. When numbers of women are working on the hulls, on board ship, or out of doors on slabs, forms, or platens, personnel assistants should be available on specific ships or in specific sections of the yard who may cut across shop lines, thus affording more direct counsel and assistance for women from different departments cooperating on a piece of work in a limited area. The women's personnel organization should include women employment and exit interviewers when the head of women's personnel or the women assistants do not assume these duties.

In yards with relatively few women, the head of women's personnel may be able to handle all matters herself with perhaps the aid of a woman interviewer and one or more roving field representatives or assistants who keep in close contact with the women workers and with the women's production supervisors.

The functions and qualifications of the head of women's personnel and of her assistants that experience has proved effective are described in the pages that follow.

The head of women's personnel.

Her functions.

Certain duties are fundamental to the position of head of women's personnel if the individual in the post is to have sufficient responsibility for effective action. She should be called upon to assist and advise the chief officer in charge of personnel in the over-all planning and coordination of employee relations work affecting women production workers. In this way she will help to formulate the general policies that will prevail in the selection, placement, induction, and supervision of women as well as in their counseling and personal adjustment to the job. Uniform policy with respect to the general steps to be taken when problems arise from the employment of women should be established in the central personnel office and maintained through the office of the head of women's personnel.

It should be the duty of the head of women's personnel to foster and maintain the correlation and cooperation of the various shipyard departments with the women's program. This should involve discussion, interchange of ideas, and development of policies regarding such matters as women's medical examination and care, their safety, training, and occupational dispersion and work progress. In this way each department of the yard is apprised of the

aid it can give in furnishing valuable information to the women's division and at the same time can learn of ways to extend and improve their programs with respect to the women workers.

It is recognized that in occasional instances proper and effective placement of women on certain shifts or types of jobs will invade established seniority rights and privileges. Procedure in such cases should be made clear and should be decided in consultation with labor and management. The women's personnel head should also have considerable direct responsibility in planning and supervising the setting up of toilet, washroom, rest-room and any other facilities, such as the cafeteria or other lunching arrangements, that women must use.

If the head of women's personnel does not do the interviewing herself, she should help to select, guide, and train, and should work closely with, the intake and exit interviewer of women, both to seek ways of improving women's selection and placement and to determine, and if possible eliminate, causes of their separation.

Where women personnel assistants are employed, the head of the women's program should choose the candidates in consultation with the shop masters or supervisors with whom they will work and subject to the approval of the chief personnel officer. She should, however, have sole responsibility for the assistants' training and direction and be available at all times to answer their questions and help them with their problems. When there are a number of assistants it is helpful to hold regular meetings with the group for interchange of ideas, threshing out of problems, and review of policy. From these meetings the head of women's personnel may select pressing matters that require quick administrative action, or situations of larger scope requiring study and careful approach with the cooperation of the entire administrative staff, perhaps even outside agencies.

The women's personnel head should supervise the setting up and maintenance of an efficient, complete, and up-to-date record system covering every woman employee. Background facts such as experience, education, age, marital status, number and ages of children and the like should be secured at the time of the intake interviews. Each woman personnel assistant, under the head of women's personnel, should help to keep the records current and be provided with a duplicate of the complete record of each of the women in her charge. Data the personnel assistants can supply relate to the job and its performance, wage status, absences, transfers, grievances and their settlement, and so forth. There should be periodical transfer to the master file of medical, accident, and training data. The material on each record and correlation of the data can be tremendously illuminating in all phases of the work with women, including, for example, job placement, transfer, promotion, and investigation into absence and turn-over.

The shipyard is not located in a vacuum, nor do the affairs of its workers begin and end with the 8-hour shift. There are many ways in which outside influences aid the worker on the job or lead to discontent, absenteeism, turn-over, and other production sabo-

teurs. The lack of adequate housing, transportation, recreation, and child care is among outside influences that affect women workers the most. It should be the responsibility of the women's personnel officer to work with the community agencies that have jurisdiction over such matters in the effort to promote introduction of community facilities that may be lacking, or reorganization, perhaps extension, of those not serving adequately if at all the important needs of significant numbers of women workers.

Careful survey of the women shipyard employees may reveal, for example, the need for more nursery schools in some areas, while there are too many in others; for their earlier opening and later closing; or for an after-school-care program. The chief of women's personnel can be influential in making the facts known and securing action. In conference with the USO, YWCA, directors of Federal Government housing projects, and others, she can lend her assistance in the expanding of existing recreation facilities to include activities and programs suitable for women and adjusted to their hour schedules. By the enlistment of civic support, the merchants of the town may be persuaded to sacrifice a morning and keep their doors open one evening a week to accommodate the busy day shift. These are examples of some of the community affairs with which a women's personnel officer can profitably concern herself to help secure better adjustment of her women workers to their jobs and consequently more nearly maximum production. She may also learn from the outside agencies with which she maintains contact ways in which the yard itself can make accommodations and introduce facilities that will temporarily relieve community limitations or serve effectively to supplement them. Rationing bureaus and room registries are examples of such services.

Her qualifications.

To perform these duties ideally, the women's personnel executive should have had experience in industrial work and labor relations affording her some practical knowledge of personnel management and labor and factory economics. In yards with union agreements it would be well if she were acquainted also with the organization, functions, and activities of unions in general and particularly with those prevailing in the yard where she is to accept an official post. Actually few women have such experience, so good fundamental education and personality and leadership qualities may have to be the basis of choice. Special education and a thorough knowledge of work operations in the yard and the conditions under which they are performed are important but may have to be gained after employment.

The most important personal qualifications to be sought are such rare and precious traits as good common sense and judgment, leadership, and organizing ability, initiative, imagination coupled with practicality, equable temperament, humor, ability to work well with others, and the faculty of persuading management to make changes that employee conferences indicate are needed.

The personnel assistants.

Their functions.

In an organization as widespread as a shipyard decentralization of the personnel staff is essential to make possible good attention to the needs of the women and to the difficulties of foremen with women workers. While in the shops, the personnel assistants work in close conjunction with the work supervisors, taking off their shoulders matters that do not pertain to the performance of the work itself. Their function is advisory to the job supervisors but authoritative as regards the women.

Whether they conduct the intake interview themselves or receive applicants selected by the central personnel office, it should be the function of the personnel assistants to aid the work supervisors in determining the suitability of women applicants for specific jobs. They should help also in completing the hiring and placement process, arranging for the workers' starting date, and similar details.

The induction and orientation of new women employees is an especially important aspect of the personnel assistants' job. A more complete detailed description of what induction should entail for new women shipyard workers will be given in a later section. When the training division is not organized to accept the induction program, part of the work of the woman personnel assistant should require, briefly, acquainting the women with yard and shop geography and with shipbuilding processes and terminology, introducing them to their fellow workers and their work supervisors; making them cognizant of shop rules, safety regulations, and proper work clothing; informing them about wages, hours, and policies that cover training, promotions, transfers, and dismissals; telling them about means of securing transportation to the yard; and many other matters. Even if there is a manual covering these points, each item bears reviewing, and sufficient time should be given to the answering of new employees' questions.

Even when formal induction has taken place, the work of the women personnel assistants should by no means be considered over with respect to orienting the women to their new job experience. This should be a continuing process. It involves careful follow-up of the new workers to help them make a satisfactory adjustment, develop good work habits, a constructive work spirit, and an attitude and sense of belonging in a cooperative enterprise. The personnel workers can be most effective also in helping supervisors to educate the women early in safe habits of work, including especially the conscientious wearing of proper work clothing. By being in the shop they are also in a position to encourage women on the job, follow up transferred employees on a new job, and watch closely employees whose work or conduct is or has been unsatisfactory.

Assistance in arranging department and interdepartment transfers of women workers should be given by the women personnel assistants. They should also cooperate with the job supervisors

in the reassignment of employees in cases in which such factors as physical disability, vocational maladjustment, lack of suitable work and the like may be involved. They are to lend aid to foremen and others in selecting women for promotion, upgrading, and retraining for new work. When employees are available for transfer who cannot be placed within the shop under their jurisdiction, the personnel assistants should refer them to the central personnel office and advise the office concerning the type of work for which they have shown aptitude. Their knowledge of work processes and women's capabilities makes the women personnel assistants especially helpful in finding ways of extending women's employment through the shop and advising the supervisors and personnel office accordingly. They are particularly well equipped to check on new jobs proposed for women by others and to assist in determining their suitability. In this general connection, the women's counselor should be on the alert for ways in which the jobs women already hold could be planned, rearranged, or reengineered to reduce fatigue and contribute to more efficient performance.

The women workers should be encouraged to take to the women personnel assistants any problems they may have that affect their relation to the job, whether the matters involve yard, personal, or family situations. To perform their function in this regard, the personnel assistants should be available for consultation at all times during normal working hours. If the professional attention of physician or social worker is required, the counselors should refer the women to qualified persons or agencies in the community for help. They should not themselves attempt to deal with deep-seated problems requiring personal and professional attention. Their function is that of detecting such problems and knowing where and how the individuals concerned can secure help.

When valid complaints or grievances about the work, shop, or yard are voiced, the personnel assistants should interpret the needs and viewpoint of the women workers and act generally as liaison between the women and their foremen or other supervisors, or help the union stewards in this. The personnel assistants should, in fact, be equipped to make recommendations and in other ways assist in arriving at a satisfactory adjustment of women's requests or grievances.

The personnel assistants should concern themselves also with giving constructive aid to the women workers in situations that, though much less directly related to the yard, nevertheless are very important to morale and work performance. This aspect of the duties may involve, among other things, helping to secure day care for children when regular arrangements have failed, aiding in the search for living accommodations, setting up car pools, or finding a nursing home for an ill relative. Assistance of this kind makes it immeasurably easier for the women workers to assume and carry out the dual role of worker and housewife and to adjust to the strange environment and work of the shipyard. Where the personnel assistant is equipped to do an intelligent job of this kind, knowing when and of what agencies to ask assist-

ance, she can bring to the women under her a sense of security, relieving them of strains and anxieties that frequently affect very seriously their production, interfere with their attendance, and cause them to leave their jobs.

Though maintenance of the women's facilities should be the function of the division of public works or a similar department, occasional suggestions to and from the women's personnel office are of course in order. But the personnel assistants should not be charged with a policing function nor should they have to clean or tend in any way the wash or rest rooms. Both capacities would detract from their status in the eyes of the women in their charge. Policing the wash and rest rooms is wholly unnecessary under a wise personnel program beginning with good selection [12] and involving careful induction [13] and orientation of women, attention to their special needs, and effective counseling.

Finally, the women's personnel assistants should be free to offer suggestions to the chief of women's personnel and refer to her any cases on which advice is needed or on which action should be taken from the main office.

Their qualifications.

It is obvious that, to do their job well, women personnel assistants should be thoroughly acquainted with the work in a shipyard and especially with the jobs in the shop or division to which they are assigned. This knowledge may be acquired as a worker in the ranks, if only for a few weeks. In any case, acceptance of the personnel job should involve also sufficient preliminary training in production work to provide first-hand understanding of processes, personnel problems, and production details.

Very early, if the personnel assistant has not already acquired the knowledge from employment in the yard in another capacity, she should become thoroughly acquainted with yard organization and policies. Here again it is important that she bring to the shipyard practical experience in either industry or business, preferably in work involving supervision. In this way she will have acquired some facility with the problems of personnel and the techniques of supervision. General academic theoretic understanding of the work also is desirable.

The personality traits that have proved desirable in a personnel assistant have a wide range. They include emotional stability, the quality of leadership without officiousness, tact, resourcefulness, versatility, adaptability, good judgment, patience, a genuine interest in and understanding of people, good insight, a sense of humor, and a knowledge of when and how to compromise.

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[12] See pp. 7 to 18.
[13] See pp. 48 to 55.

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See also the following publications of the U. S. Department of Labor that will be helpful to counselors wanting information on standards relating to working conditions.

Division of Labor Standards. Special Bull. 13. *Wartime Working Conditions.* 1943. 25 pp.

Women's Bureau. Special Bulletins:

2. *Lifting Heavy Weights in Defense Industries.* 1941. 11 pp.
3. *Safety Clothing for Women in Industry.* 1941. 11 pp.
4. *Washing and Toilet Facilities for Women in Industry.* 1942. 11 pp.
5. *Women's Effective War Work Requires Time for Meals and Rest.* 1942. 4 pp.
6. *Night Work for Women and Shift Rotation in War Plants.* 1942. 8 pp.
9. *Safety Caps for Women in War Factories.* 1942. 4 pp.
10. *Women's Effective War Work Requires Good Posture.* 1943. 6 pp.
14. *When You Hire Women.* 1944. 16 pp.
16. *The Woman Counselor in War Industries: An Effective System.* 1944. 13 pp.

7. *Give new women workers preliminary induction into the work and environment of the shipyard before putting them on the job.*

All new and inexperienced workers, men or women, benefit from some more formal introduction to a strange job and work environ-

ment than the brief hiring process itself affords. Women who are entering the shipyards for the first time with little if any experience even in lighter industries are especially in need of orientation. The noise and confusion of the typical yard is frightening to one new to industry; the myriad activities and specialized terminology are strange. It is no wonder that labor turn-over is highest in the first 2 to 4 weeks of employment. Anything that can be done to ease the woman employee's adjustment to her new job and work environment in this period will reduce this turn-over considerably and at the same time increase the level of efficiency and productivity in the yard.

Induction and orientation of the new woman worker actually begins with her first interview as an applicant and continues with all her contacts in the hiring process. It is important that these contacts help her to feel at ease and begin to give her some information about the shipyard and its work as they assess her ability and qualifications for employment. A woman counselor can do much to establish friendly contacts for her.

Organization of the induction program.

The organization of the formal induction process varies considerably from place to place. Most of the yards visited that had an orientation program were giving only a few hours or at most a day to it, and both content and administration seldom were satisfactory. There were a few yards, however, effectively organized for the indoctrination of new women workers; their programs gave excellent results. In most cases the training department was actively engaged in it. It was said of one of these yards that the induction procedure there had much to do with the success with which women had been quickly adapted to many unusual types of work. Women were employed here on repair work as well as new construction.

The plan in shipyards particularly successful with their indoctrination program consisted usually of a preliminary group of lectures and discussion lasting from 1 to 3 days and covering such matters as safety education, the wage system, opportunities for industrial education and upgrading in the yard, shipbuilding terms and naval nomenclature. The new workers were then assigned to their various departments. In one of the yards, formal placement in a job did not take place until the preliminary indoctrination course was completed. Their plan included also extension of the orientation program into the various shops or departments where the women were assigned. Consequently, after general indoctrination the new recruits received in addition from several hours to days of instruction in the shops, covering such things as shop rules, rest periods, vacation or sick leave, punching of time cards, and the like, and in some instances formal classroom introduction to the elements of the department's work, including the use of tools, safe ways of handling them, and simple operations.

One yard was making plans at time of visit for providing a spe-

cial induction program for women who will work on board ship. This is an excellent idea, since many of the problems of climbing, weight lifting, and accommodation to unusual conditions occur more frequently on the hulls and ships. A summary of the preliminary indoctrination course already held in this yard follows. It is among the best encountered in the war industries by the Women's Bureau field representative reporting it. Each of the shops where numbers of women are employed conducts in addition a short indoctrination program of its own, instruction being given by the women personnel assistants or the master, quartermen, or foremen, depending on shop set-up.

Summary of Indoctrination Program

First day:

- Experience record—instruction for filling in (1 hour).
- Introduction—"Womanpower in Industry" (1 hour).
- School rules and regulations—hours, time cards, smoking, conduct, safety and health, lunchroom and lockers, property passes.
- Information handbook—
  - Purpose of handbook.
  - Musters.
  - Tardiness and absence.
  - Leave (annual and sick).
  - Safety rules and regulations—
    - Attention to the job.
    - Common sense.
    - Type of clothes worn.
    - Fire hazards and smoking.
    - Injuries.
    - Personal health.
  - Responsibilities—tools, materials, and workmanship.
  - Discharge.
  - Consulting officials—organizational procedure.
  - Housing and transportation—
    - Explanation of facilities.
    - How and where to apply.
  - Industrial education—
    - Apprentice school.
    - Trainee school.
  - (Test on above.)

Second day:

- Aptitude test (2 hours).
- Safety lecture (1 hour).
- Definition of ship terms (1½ hours).
- Nomenclature of naval vessels (1 hour).
- (Mathematics test—1 hour.)

Third day:

- Simple arithmetic (1½ hours)—
  - Value of mathematics.
  - Rules involved.
  - Whole numbers.
  - Fractions.
- (Test in arithmetic.)
- Moving pictures (1 hour).
- (Nomenclature test—1 hour.)
- Fire-chief talk (1 hour).
- (Information Handbook test—45 minutes.)
- (Assignment to shops for most women.)

Fourth, Fifth, and Sixth days:
(For a selected group.)

Tool equipment and supplies (explanation of use of tools and identification of tools and equipment).

Electricians' tools and equipment.

Shipfitters' common hand tools.

Sheet-metal-workers' tools—hand tools, machine tools for sheet metal, including: squaring shear, power circular shear, lever-slitting shear, nibbler, high-speed shear (large), bar folder, brakes, forming machines or rolls, grooving machines, bench machines.

Burring machines.

Beading and crimping machines.

Machinists' bench-work equipment: use of vises, chisels, wrenches, hand reamers, hack saws, shears, pliers, nippers, hand taps, files, hand dies (thread cutting), babbiting (lining bearings), scarfing (pushing off metal to give finished surface, using venetian red or prussian blue to mark high spots), portable and pneumatic hand tools (air drills, chipping hammers, air grinders).

Machinists' lay-out tools: center punch, prick punch, lay-out table or bench plate, scriber, dividers, machinist's scale, calipers, square, bevel protractor, parallels, angle plate, surface gages, etc.

Machinist's tools: scales, calipers, squares, protractors, micrometers, height gages, surface gages, thickness gages, center gages, screw pitch gages, ring gages, etc.

Pattern-shop tools: band saw, circular saw, cut-off saw, jointer (hand planer), surface planer, woodworking lathe, sanding machine, "Oliver" oilstone grinder, type-embossing machine, chisels, gouges, etc.

This program includes most of the topics needed to give new women workers effective introduction to the shipyard. It is well to discuss some of these and to mention some not included that have been found especially helpful.

Content.

One of the first needs is to acquaint the new employees with a brief but graphic description of the shipbuilding process so that they may see the relation of their work to the whole. They want to know how their job fits into the picture. Presentation of this information offers also an opportunity to give the new workers a sense of pride in their war job. There has been too little morale building in many places.

Very early, the women require an informal introduction to enough shipbuilding terminology and naval nomenclature to enable them to feel at home in the new environment, understand directions, and find their way about. "The new employee who is told to report to port tank 4 or poop deck starboard will be glad she learned the difference." [14]

A preliminary tour of the yard is recommended, so that the new employees will learn the important landmarks. At the same time they can be shown the sorts of ships they will help to build and repair. Not only must they know their own workplace and how to find it, but where their rest room and lockers are, where to secure and eat their lunch, where to go for first aid, how to find

[14] U. S. Office of Education. *Report on Welding Training and Shipyard Employment*, by Augusta H. Clawson. 1943. p. 9.

the industrial relations office, and so on. Posted maps of the yard are helpful; they may be used as explanatory charts during one of the induction lectures, thus preventing their being left to explain themselves.

This is an example of what can happen when the new woman worker is given no preliminary guidance in yard geography:

> The ways are so large and cover so much ground that one is conscious only of confusion at first. I could not find checking station No. 1 and no one seemed to know its location. After wasting perhaps 15 minutes, I found it, received a badge, and was turned over to a new welder who knew the yard from her days as a laborer. We went in quick succession to a shop under one of the ways for rod boxes, to a lunch room to leave our lunch boxes, to a tool crib for stinger and brush, to a rod shop for rods and glass, and to the welders office to be assigned a day off. My guide, perhaps by way of being perverse, took me through the skids to get from one way to another. I could get no sense of direction out of it, with the result that at night I returned my equipment to welders lunch room 14 but got the wrong way and found it was the men's lunch room. I traced down the women's but was 5 minutes late getting there, so could not get my lunch box. . . . By then I had delayed too long and the last bus had left.[18]

Within the first few days the new women workers should be made acquainted with the various rules and regulations of the yard. Many of the shipyards issue a handbook that provides this information. Some of the handbooks cover, in addition, such important matters as the location of community services available for securing care of children, medical care, recreation, transportation, food, and so forth. Most of those seen by Women's Bureau agents have been written simply and arranged well. They make further discussion of the points covered more easily and effectively accomplished, and if presented to the worker when she is hired they provide a handy reference. The handbook cannot be relied on entirely, however, to put the information across. The most important items, such as safety regulations, proper work clothing, rest and lunch periods, time-clock and clock-card regulations, the wage system, social-insurance plans, passes, opportunities for training and upgrading, and the like, need careful reviewing, and it pays to give ample opportunity for questions.

Especially should complete and emphatic safety instruction have a prominent place in the orientation program. It is essential that the specific dangers and hazards that the women will encounter in the yard be clearly presented. Careful instruction should be given also concerning how prevention of accident and illness from these sources is handled in the shipyard by management and what must be done as a necessary part of the program by the individual worker. It cannot be emphasized too strongly that preliminary instruction of this kind should be well planned and organized and effectively presented. Women new to industry know little if anything about industrial conditions and hazards. They must be given information if accidents are to be prevented, work time saved, and production schedules met.

[18] Ibid., p. 4.

Part of the safety section of the induction program or part of job-training time could be devoted profitably to active demonstration of how to lift weights and how to climb, especially on the platens and on the hulls where temporary staging makes footing none too steady. Many of the hazards to inexperienced women involve danger from improper weight lifting and climbing in precarious places. It is best to give clear instructions beforehand concerning the various situations that will arise and ways of meeting them. Visual aids and demonstration are especially helpful in making such information part of the employee's knowledge.

It has been recommended also by a shipyard physician that women welders receive instruction in their training course, if not in the preliminary induction period, in methods of coiling their lines, carrying them, and climbing with them. The lines alone weigh about 35 pounds and women have been found to suffer ill effects from pulling, lifting, and climbing with them, especially when several other heavy lines may be stacked on theirs. Instruction in weight lifting is of course basic here.

Physicians recommend in addition that for a period beginning with their first day and continuing through the first few weeks of their employment the women workers who will hold such jobs as welding, burning, and shipfitting, especially on the hulls and ships, be given a period each day of physical conditioning. Few women have back or stomach muscles adequately developed for work in the heavy industries. Wherever necessary, however, they can be conditioned gradually by means of systematic muscular reeducation. Those receiving such training will then be able to meet safely the unusual stresses that occur frequently in the shipyards, where women may be required to enter almost inaccessible places to weld from a variety of difficult positions, and to climb handicapped by heavy garments and equipment that throw them off balance. It is of course to be preferred that women be given shop work first, even when they are to be placed later on in the yard, on the hulls, or on ships, to accustom them more gradually to the noise and strangeness. Physical education could be carried on in this period.

Careful attention to getting the women workers off to the right start with safe and sensible work clothes will prevent confusion, expense, and needless risk. It is distinctly advantageous, therefore, for the induction program to include description of each article of clothing and of protective equipment recommended. Every safety feature requires explaining. The new women recruits, unused as they are to industrial work, usually have many questions about clothing, proving the need for an adequate period in which the regulations may be discussed so that they are thoroughly understood. Helpful also is a display of sample work garments, properly labeled, wherever women applicants, trainees, and inductees congregate.

These are some of the queries one welder had to answer by herself when she bought her initial equipment: Should overalls fit snugly or be loose? Should one purchase the kind with straps

for tools? Should one buy short or long socks, cotton or wool? She writes further: "We were given no advice on clothing and many of us had flash burns and slag burns on our necks. Our slacks were perforated with small burns and some caught fire and burned sizeable holes. Those who wore low shoes frequently had ankle burns. My glasses were well pitted by slag before the matron in the rest room told me to ask for goggles in the office. We still had many questions unanswered and would have welcomed a chance for class discussion." [16]

Good health is fundamental to the steady and efficient worker. A part of the women's induction program could profitably be given over to the medical department for instruction in personal health and hygiene and in nutrition. Those women who have heard the myth that infertility may result from exposure to welding rays should have their fears dispelled. All women would benefit from instruction in proper pacing of their work to avoid overfatigue in the first weeks of employment. Those subject to regular monthly dysmenorrhea should be encouraged to seek help from the medical department and information concerning corrective exercises. All the women should be informed of first-aid and rest facilities and of regulations regarding rest for temporary discomfort. The pregnancy policy of the yard also could be discussed.

It is recommended that in yards with a closed-shop agreement facts about the union be presented by a union representative as part of the women's induction program. Most women workers come to their war jobs with no practical knowledge of labor organization but with considerable misinformation. A great deal could be done for smooth functioning of labor-management relations and for the early adjustment of the women workers if the status of the union in the yard and its objectives and activities were made known in the first few days of the women's employment.

Administration.

The methods by which the induction program is carried on will depend largely on the organization and facilities of the yard. It is to be expected, however, that those responsible for the program will be well posted on women's needs and problems and know something of effective teaching methods. In some yards the training department alone conducts the induction, in others the personnel assistants. In some, various departments in the yard—personnel, safety, medical training, and production—cooperate in the procedure, lending capable representatives to participate.

Visual aids such as films, slides, models, and the like are especially effective in a short orientation program. Films that have been made for plant use by Government and private agencies are listed in the following bulletins with instructions for borrowing or purchasing selections:

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[16] Ibid., pp. 2 and 3.

National Industrial Conference Board, Inc. *Visual Aids in Industrial Training.* New York, 1943. 60 pp. This includes also discussion of current use and evaluation of visual aids in training.

U. S. Office of Education. A Partial List of References. Vocational Training for War Production Workers. *Visual Aids.* Washington, October 1943. 109 pp.

U. S. Office of War Information. *A List of U. S. War Information Films.* Washington, April 1943. 28 pp.

Close follow-up of the new women workers after formal induction is especially necessary during the first few weeks of employment. The more women workers a yard can pull through this orientation period successfully, the lower its turn-over and the less costly its training program. The speed and efficiency of the production schedule itself may depend to a significant degree on the quality of the introduction process.

The following agencies may be consulted on the matter of an induction program:

National Industrial Conference Board, Inc. 247 Park Avenue, New York, N. Y.

U. S. Department of Labor, Women's Bureau. Washington, D. C.

U. S. Office of Education, War Production Training Division. Washington, D. C.

U. S. War Manpower Commission, Bureau of Training, Training-Within-Industry Division. Washington, D. C.

8. Provide personal-service, food, and medical facilities that meet approved standards of adequacy and quality.

Washing, toilet, locker, and rest-room facilities.

When women are employed in any industrial establishment for the first time, almost the first consideration is the provision of separate facilities for their personal needs. This is something that practically every employer recognizes as essential. In every yard visited where women were employed, facilities for them existed, but in many cases such facilities had become inadequate by the time of the Women's Bureau survey.

It was obvious that in not a few instances facilities were overtaxed because very early the accession of women workers far exceeded expectations and reached the saturation point of the facilities before priorities, materials, and cost affirmations or fund approvals from Navy Department and Maritime Commission could be secured. Some of the trouble was ineffectual planning, and planning that did not take place far enough ahead of the time women were to be hired; in a few cases it was sheer negligence.

Practically all the shipyards now employ women if they intend ever to do so, and now that new hires of women workers to replace men are made according to an established schedule submitted to the War Manpower Commission, there is no longer any excuse for failing to anticipate women's needs in the way of such service facilities as washrooms, toilets, lockers, and rest rooms.

It is advisable for all shipyard managements employing women to make an over-all review as soon as possible of their facilities situation, and in the light of accepted and authoritative standards make such necessary additions and adjustments as are indicated. This would, incidentally, help to effect more uniform standards and provisions in the navy yards where the autonomy of the shop masters has prevented it. In one navy yard some shop masters had secured or allowed provision of soap and towels in the women's washrooms, while others were unable to secure or did not allow these essentials, requiring the women to furnish their own and keep them in their lockers.

In another navy yard, at one juncture the master of the shop employing the largest number of women workers had the toilet doors removed in the women's washrooms because of suspected lingering. When the women protested, doors only 3 feet high were put on, allowing only semiprivacy. This is below the State legal requirements for that yard and far below the standards recommended by the Women's Bureau, which stipulate that the top of partitions on each toilet unit be at least 6 feet from the floor and the bottom not more than 1 foot from the floor. Such matters are not properly within the jurisdiction of shop masters, but belong in the hands of the sanitary engineer or public works or service department and under general surveillance of the women counselors and head of women's personnel. Good supervision of women workers and a knowledge of minimum standards in the matter of personal-service conveniences should not be expected of the shop master himself. His work is in the production field.

In the interest of the over-all review and adaptation of facilities recommended, it is necessary that the Navy Department and Maritime Commission cooperate by systematizing and speeding up the machinery for passing on, and authorizing funds for, women's personal-service conveniences when such authorization is sought. Industrial establishments of course do not have to seek authorization except when the matter of reimbursement involves a reconsideration of the contract. Many manufacturers consult the cost accountants of their contracting agency before making most expenditures for facilities, for assurance that these expenditures will be reimbursed under their contract. Those on a fixed-price contract must pay for new facilities out of their profits.

No matter what type of contract the shipyard has, good toilet, washroom, locker, and rest-room facilities for women are an excellent investment because of the saving in time they afford and the direct effect they have on women's morale and adjustment to the job.

Minimum standards that should govern the location, number, size, type, ventilation, lighting, sanitation, and materials to be used for workers' washrooms, toilets, and dressing rooms have been formulated by authorities and presented clearly and concisely in bulletins by the Women's Bureau and the Division of Labor Standards of the Department of Labor, and by the National

Safety Council and the American Standards Association.[17] These should be complied with in the shipyards.

Various States have enacted legislation to cover one or more of the features mentioned. Wherever legislation is in effect, the shipyards are for the most part complying, but the regulations are incomplete and inadequate in many of the States where yards are situated.

The general standards recommended by Government and other authorities will not be repeated here. It is important, however, to relate those standards to the special needs in a shipyard.

Location.

The matter of convenience of location of personal-service facilities is paramount in the shipyards, where acres of ground may be covered and shops and ways may be far apart. When women are working on the hulls and ships, convenience of location is especially to be considered, for not only is distance a factor, but the amount of time and effort necessary to climb up or down from the workplace and make one's way over and around obstacles in order to reach the facilities.

For this reason, in large yards with little room for additional building, temporary facilities that meet accepted standards should be placed near the ways where women are working. These facilities may be in the form of trailers or demountable houses and need not contain more than the necessary number of toilets and washbasins with soap and towels and other usual accommodations. Locker, shower, and rest-room needs can be more centralized, and with adequate toilet and washing facilities can serve the women in nearby workplaces throughout the shift and serve the women in outlying areas and on the ships and hulls at entering and closing time and during rest periods.

Provisions.

Because much of the work the women are doing in the shipyards is heavy and dirty, it is recommended that 2 or 3 showers with accompanying dressing booths be provided in each large washroom, especially when women are employed out of doors or on the ships and hulls or are working with bitumastic, paint, solvents, or preservatives. Women appreciate such a convenience, especially those who must travel a long distance after putting in a day of hard and dirty labor.

Important to women is the provision in each toilet room of a vending machine for sanitary supplies, well filled and in order, and a covered receptacle. Sanitary and disposable toilet-seat covers also are desirable equipment.

Women in shipyards, especially those who work out in the yards and on the ships and hulls, have a good deal of gear, such as leathers, gloves, safety shoes, and so forth, as well as slacks and

[17] See references at end of this section.

caps. Many would prefer changing to their work clothing after arriving at the yard rather than wearing it from home in crowded buses and on the streets. It is recommended that each woman worker be given a locker of good size to hold her street clothes during working hours and her work clothes and equipment at other times. For sanitary reasons metal lockers are preferred, but wood is acceptable under present conditions. Provision for ventilation is important.

According to the American Standards Association,[18] rest rooms separate from workrooms should be provided in all workplaces where 10 or more women are employed. The recommendation reads that "The number of such beds or couches required shall be as follows: 10 to 100 women, one bed; 100 to 250 women, 2 beds; and one additional bed for each additional 250 women employed." A fairly generous standard for the average industrial establishment probably is the *minimum* necessary in a shipyard where much of the work is physically demanding and is unfamiliar to women. Often a few minutes of relaxation in the prone position will allow a woman to function adequately for the remaining hours of her shift, whereas otherwise she would be inefficient on the job or have to go home, thus sacrificing wages and adding to the man-hours lost through illness. A brief period of rest on a couch is all that many women need to help them over a period of dysmenorrhea. Lacking this, some must take longer time and others prefer to stay at home a day when they know they are going to be uncomfortable.

Attention should be paid to the location of rest facilities in the shipyards. If women who merely need a few minutes of rest must walk for 10 or 15 minutes to get it or must report ill and go to the central first-aid room some distance away, they will be deterred from seeking it. Therefore, cots for women should be conveniently located in rest rooms close to the ships and hulls, as well as in the yard or shops.

Of 24 yards that reported on the matter of rest rooms, 17 provided rooms for that purpose though 3 of these had no cots. In 4 yards the only place to lie down was in the toilet rooms, and 3 yards had no rest-room provision of any sort. A few excellent facilities were seen. For example, one yard with only 140 women on production had a well-equipped rest room with leatherette couch and easy chairs with footstools. It was separate from the toilet, wash, and locker room. The leatherette used in the rest room is particularly effective, for it can be washed easily and does not show slight soiling as do so many fabrics. These are important advantages in view of the dirt and grease that accumulate on the women's work clothes.

It is necessary that the rest rooms be heated to afford women working out of doors in the winter a place near their work where they may go to get warm. This convenience is especially to be

[18] American Standards Association, *Safety Code for Industrial Sanitation in Manufacturing Establishments*. New York, 1935. pp. 16-17.

stressed in the case of shipyards in the North Atlantic area, where women often work outside in below-zero weather.

Food service and facilities.

The case for good feeding.

The tin lunchbox is still part of most shipyard workers' gear because adequate and convenient food service and facilities are not available in the vast majority of yards. Even the new yards, built and organized for war production, are seldom equipped with satisfactory facilities for providing good and sufficient food to production workers.

Yet the production army, fully as much as the military army, travels on its stomach. The food of the production army has a telling effect on output, efficiency, health, attendance, and freedom from accident. Objective study in Great Britain has shown that improvement in workers' diets that were not up to standard for good health is followed by increased effort and by reduction in the number of accidents. Nutrition workers have known for many years that vitamin-deficient diets result in greater fatigue, lassitude, and loss of interest in work, in depressed mental states, soreness of muscles, backache; while even more important, because general and less evident, is the lowered resistance to illness and decreased efficiency that result. It has been said that nutritional deficiency, "hidden hunger" as it is called, constitutes "our greatest medical problem, not from the point of view of deaths, but from the point of view of disability and economic loss."

Lack of facilities and opportunity to buy nourishing food in the shipyards is serious, but it would not be quite so serious if the majority of workers were known to secure an adequate and well-balanced diet through meals bought at other places or prepared at home. This is not the case, however. In fact, a comprehensive survey made by the Bureau of Home Economics of the United States Department of Agriculture in 1936 showed that fewer than a fifth of America's families had diets that met the National Research Council's recommendations for each of the seven nutrients considered (protein, calcium, iron, vitamin A, thiamin, riboflavin, and ascorbic acid). Furthermore, practically all dietary surveys of industrial workers agree that the diets of women employees are not even so good as those of men, though women tire more easily than men and require food more frequently.

Thousands of the women in shipyards are breadwinners and homemakers too. They should eat well to play their dual role successfully. Yet their work schedule and transportation to and from the yard, frequently absorbing as much as half of each 24 hours, leave little time to prepare an ample and well-balanced dinner even when good nutrition is understood and practiced. Breakfast more often than not is missed entirely or consists of such nutritionally deficient foods as doughnuts or pastry and coffee. The food supply in the stores, limited at best under wartime scarcity and rationing, is lowest after working hours, when most of the ship-

yard workers must shop; the point system adds to the time required for shopping and to the complexity of the food-preparation problem.

Single women living away from home, of whom there are great numbers in the shipyards, must overcome still other difficulties. In the areas where large shipyards are located eating facilities have not kept pace with the extraordinary population increase. In some of them only the most inferior accommodations are available for workers who must get their meals out.

Night workers are particularly at a disadvantage, since even in normal times facilities for proper eating are limited at their hours of need. But most serious of all is the actual lack of food in some shipbuilding areas due to breakdown in distribution to these places that require now so much more in the way of outside fresh produce than in normal times.

Added to the situation just described, making adequate nourishment difficult for shipyard workers and especially for homemakers, is the fact that rules of nutrition are not generally known, much less practiced. Even where food is plentiful, not too expensive, and of sufficient variety, and there is ample time to buy, prepare, and eat it, many workers do not select a balanced diet and few pack a lunch box that meets nutritional requirements.

To sum up, the food situation is one that cries for constructive and immediate action. It has come to the attention of the Maritime Commission and that organization is now working to develop feeding plans in the approximately 70 yards with which it has contracts.[19] These plans will be made in each case with the active participation of the plant engineer, the director of the yard's medical department, and the industrial relations adviser or his representative in the region. Labor is to have a voice in the operation of any feeding accommodations proposed and set up. The Commission has assured management and labor of its readiness to provide all needed facilities for the type of feeding found most suitable for each yard's individual needs. Because of particularly pressing need in the San Francisco Bay area, action there will be taken first. This interest and attention of the Maritime Commission to the food situation in shipyards is an important step forward. It is to be hoped that the Navy Department, with contracts in about two-thirds of the private commercial yards constructing new vessels, will follow suit.

Shipyards without good food service are as a matter of fact missing an excellent opportunity to make an investment guaranteed to pay high dividends in increased efficiency, greater resistance to disease, fewer accidents, better attendance, and higher morale. Numerous firms in other industries have for some time been reaping the benefits of good eating facilities and sound nutri-

[19] See memorandum *Report and Recommendations on Shipyard Feeding* issued by Horace D. Willis, Chief Feeding Consultant, to Daniel S. Ring, Director of Division of Shipyard Labor Relations, U. S. Maritime Commission, dated Sept. 27, 1943. See also Memorandum to all Regional Directors of Construction about *Plant Feeding Policy* from Daniel S. Ring, dated Nov. 26, 1943, and a memorandum dated Oct. 23, 1943, to the U. S. Maritime Commission from Daniel S. Ring on the same subject.

tion education for workers, and several have gone so far as to promote and help carry on community nutrition programs. These programs in a few cases now include national dissemination of literature advising about industrial feeding and instructing in proper diet. Such literature may be secured by shipyards interested in installing food facilities and in developing nutrition programs.[20]

Recommendations for food service.

To meet the problem of inadequate diet among workers and to alleviate somewhat the conditions arising from the difficulty of purchasing and preparing food in the time away from the yard, private, State, and Federal agencies and organizations concerned with industrial nutrition and equipped professionally to recommend and advise urge strongly that adequate food service and facilities be made available or expanded within the plant itself. Such service and facilities should afford opportunity for workers on all shifts to obtain and eat a complete, well-balanced, mid-shift meal in the time allotted them and at a price they can afford to pay. When a cafeteria already available cannot accommodate an expanded work force or employees in remote sections of the yard on the hulls and ships, and additional cafeteria space or materials cannot be allotted, mobile canteens or rolling kitchens are found very successful as supplementary feeding facilities. Stationary canteens scattered throughout the yard may be necessary also. All should provide hot and nutritious food rather than the more common cold sandwiches, pies, candy, and carbonated beverages. Furthermore, effort should be made by staggered lunch periods, provision of benches in cleared locations outside or indoors, to seat as many employees as possible, so that they may lunch away from their workplaces and in pleasant, comfortable and quiet surroundings.

One of the largest shipyards visited has comfortable benches placed here and there throughout the yard for workers to use at lunch time in good weather. The largest shop in this yard has a room furnished with tables and chairs and devoted entirely to the use of employees who carry their lunch or buy food from nearby canteens. A comfortable place under shelter is especially necessary in inclement weather or when it is excessively hot or cold.

Food services owned and operated by the plant are to be preferred to food concessions because of the more direct control that can be exercised over food selection, preparation, and cost to the worker. But in many cases management by a concessioner offers the more practical solution to the shipyard's food-service problem. When this is true, it is recommended that the shipyard employ a trained dietitian or secure the advice of the State or local committee on nutrition, and not only control the prices that can be charged the workers but take responsibility for the nutritional adequacy of the meals and other food provided by the concessioner.

[20] See selected references at end of this section.

A wide choice of a la carte dishes is to be avoided in favor of one or two complete meal combinations, each containing at least one-third of the worker's nutritive requirements for the day. In this way, cost is kept at a minimum and the women workers will select and come to know and enjoy a proper diet.

For women who continue to carry their lunch even when the time and facilities for eating a hot lunch in the yard are available, hot foods should be provided in easily accessible places to allow supplementing the box lunch at low cost.

Such protective foods as milk should be as cheap or cheaper than rival beverages of less nutritional value. In fact, it is recommended by experts that candy, soft drinks, and highly-milled non-enriched cereal products be replaced by foods and beverages of greater nutritional value. Serving soft drinks only in vending machines in the plant and not in the cafeteria has helped to increase the sale of milk by almost 25 percent in a prominent aircraft plant. It is unsound to run a cafeteria or other eating facilities with the purpose of "giving the workers what they want." Presenting them with a good choice and variety of foods such as they need to maintain health and efficiency has met with enthusiastic response in all cases where it has been tried. Furthermore, even without any additional effort good feeding promotes nutritional education that reaches beyond the gates of the yard and into the homes of the workers. Thus, the shipyard reaps benefits not only from good feeding in the plant but from the improved feeding in the home.

Supplementary feeding between meals in the middle of each work spell before and after lunch is an effective production aid. Mobile snack wagons are used successfully for this purpose in shipyards, for they may be wheeled in a minimum of time to all parts of the yard and docks and may be hoisted by crane onto a ship. Between-meal feeding is especially recommended for women, who tire more rapidly and require food more frequently than men. The rise in efficiency and in production that results from mid-shift feeding is especially notable when the foods supplied are such as to make a definite contribution to the day's nutritive requirements. Fruit juices, raw fruit, tomato juice, milk, and sandwiches (of whole wheat and enriched bread) have a more prolonged effect than pure carbohydrates such as soft drinks and candy bars.

The three breaks for refreshment, two of them in an official rest pause, have been shown to send employees off duty with less fatigue than is the case when they have a noon meal only. This is important to the many women who must travel long distances to and from work and then must shop and prepare a meal.

As a matter of fact, in some shipyard locations where the community eating facilities are inadequate to meet the needs of shipyard workers on all shifts or where housing and transportation present special problems, it is advisable that breakfast, lunch, and dinner be offered at the yard, thus making cafeteria or canteen service available on a 24-hour basis. This is not a visionary recom-

mendation. At the time of survey, one shipyard, a navy yard, far removed from outside food facilities, provided 24-hour service in 2 of its 3 stationary cafeterias and in 1 of its 3 portable canteens. A coffee shop operated just outside the yard gate by a concessioner was open from 6.30 a. m. to 12 midnight. These facilities together met some if not all of the demand for breakfast and dinner service on each shift by the many thousands who commuted long distances or had neither time nor place to prepare food or to eat it. Some employers are now preparing food in central kitchens to be taken home and reheated by women workers for family consumption.

Not one of the private shipyards in the Women's Bureau survey reported cafeteria service on a 24-hour basis, but one was planning such service. Actually, though several of the largest yards obviously needed some kind of day and night food service that would provide workers with breakfast and dinner as well as lunch, these yards were at that time not even equipped to serve lunch to more than a fraction of the day shift. Occasionally in such cases, arrangements can be made with commercial eating places, provided they meet accepted standards, to feed shipyard workers before and after shift change. Such arrangements require cooperation and good planning and supervision.

An employee-elected committee of workers to cooperate with management in solving problems that concern food service and facilities has proved an effective way of assuring the success of the feeding venture in other industries. Such a committee, when kept in touch with questions of finance, labor, and administration, constitutes a nucleus of well-informed employees to handle complaints and confer with the company on matters of policy.

An excellent opportunity is provided each shipyard for effective nutrition education along with its food service. Attractive posters in the yard and shops and on the cafeteria walls, articles in the employee or yard newspaper, leaflets, and short talks over the public address system are simple and effective ways of teaching the principles of good eating for good health. Emphasis on any particular food, unnecessary in recommending a balanced diet, should be avoided because of national and regional food folkways. Cooperation between the personnel, production, and medical offices in carrying on the nutrition education program will assure its effectiveness and help to bring about that favorable situation in which the workers will not only want to eat nutritionally adequate meals but will demand them in the plant and at home. It will be found of considerable benefit if the trained dietitian, preferably employed in the medical department and under supervision of the yard physician, besides controlling the menus and directing nutritional education is available to the employees for advice on diet.

For women who continue to carry their lunch even when the time and facilities for eating a hot lunch in the yard are available, hot foods should be provided in easily accessible places to allow supplementing the box lunch at low cost.

No shipyard need hesitate to plan good feeding for its workers because of lack of professional advice and direction. The Nationwide National Nutritional Program, and recently organized Inter-Agency Committee on Food for Workers, through the War Food Administration reach into every State and locality and can provide each yard, large or small, with expert assistance. Shipyards seeking aid should get in touch with their local nutrition committee or with their State representative of the Nutrition in Industry Division of the Food Distribution Administration. Many areas of assistance are available besides advice and help on setting up and securing service and facilities. These include such educational aids as posters, pamphlets, films, and nutrition news service. Some examples are given in the Selected References that follow. A more complete list of sources can be secured from the section "Sources of Information and Material" presented in the Manual of Industrial Nutrition issued in 1943 by the Food Distribution Administration, Nutrition and Food Conservation Branch, Washington, D. C.

SELECTED REFERENCES

Washing, Toilet, Locker, and Rest-room Facilities

Agencies.

American Standards Association, 29 W. Thirty-ninth Street, New York, N. Y.

National Safety Council, 20 N. Wacker Drive, Chicago, Ill.

U. S. Department of Labor, Division of Labor Standards, Washington, D. C.

U. S. Department of Labor, Women's Bureau, Washington, D. C.

Literature.

American Standards Association. *Safety Code for Industrial Sanitation in Manufacturing Establishments.* New York, 1935. 17 pp.

National Safety Council. *Drinking Water, Wash and Locker Rooms, and Toilet Facilities.* Chicago, 1941. 11 pp.

U. S. Department of Labor, Division of Labor Standards. Special Bull. 13. *Wartime Working Conditions: Minimum Standards for Maximum Production.* 1943. 25 pp.

——— Women's Bureau. Special Bull. 4. *Washing and Toilet Facilities for Women in Industry.* 1942. 11 pp.

Food Service and Facilities

I. Agencies that offer guidance to companies in developing nutritional programs.

American Medical Association, Council on Foods and Nutrition, New York, N. Y.

Food Distribution Administration of the War Food Administration, Nutrition and Food Conservation Branch, Washington, D. C. Also regional offices.

Metropolitan Life Insurance Company, Policyholders' Service Bureau, New York, N. Y.

National Association of Manufacturers, 14 W. Forty-ninth St., New York, N. Y.

National Research Council, Committee on Nutrition in Industry, 2101 Constitution Ave., Washington, D. C.

Nutrition Committees, Defense Councils.
State Extension Services.
State Health Departments.
U. S. Department of Agriculture, Bureau of Home Economics, Washington, D. C.
U. S. Public Health Service, Industrial Hygiene Division, Bethesda, Md.

II. Other organizations supplying materials such as films, pamphlets, and posters.

American Dietetic Association, 185 N. Wabash Ave., Chicago, Ill.
American National Red Cross, Washington, D. C.
Armour & Co., Chicago, Ill.
Bridgeport Gas Light Co., Bridgeport, Conn.
Evaporated Milk Association, 307 N. Michigan Ave., Chicago, Ill.
Florida Citrus Commission, Lakeland, Fla.
General Electric Co., Bridgeport, Conn.
General Mills, Chamber of Commerce Building, Minneapolis, Minn.
H. J. Heinz Co., Research Department, Pittsburgh, Pa.
Institute of Life Insurance, 60 E. Forty-second St., New York, N. Y.
Lily-Tulip Cup Corp., 122 E. Forty-second St., New York, N. Y.
National Association of Food Chains, 726 Jackson Place, Washington, D. C.
National Dairy Council, 111 N. Canal St., Chicago, Ill.
National Industrial Conference Board, Inc., 247 Park Ave., New York, N. Y.
National Livestock and Meat Board, 407 S. Dearborn St., Chicago, Ill.
Prudential Insurance Co. of America, Newark, N. J.
Servel, Inc., Evansville, Ind.
Standard Brands, 595 Madison Ave., New York, N. Y.
Swift and Co., Department A, Chicago, Ill.
Westinghouse Electric and Manufacturing Co., Mansfield, Ohio.

III. Publications containing helpful information on background, practice, and problems of industrial nutrition.

American Telephone and Telegraph Co. *Food Makes a Difference.* New York, 1943. 94 pp. A course in nutrition for women.

Borsook, Henry. "Industrial Nutrition and the National Emergency," *American Journal of Public Health,* vol. 32, May 1942, pp. 523-528.

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Factory Management and Maintenance. "Promoting Nutrition to Employees," vol. 101, January 1943, pp. 90-92.

Federal Security Agency, Office of Director of Defense, Health and Welfare Services, National Nutrition Conference for Defense. *Proceedings,* 1941, pp. 116-129. Washington, 1942.

Great Britain. Ministry of Labor and National Service. *Additional Meals at Factory Canteens: Breaks During Long Spells of Work.* London, January 1941. 2 pp.

Haggard, Howard H., and Leon A. Greenberg. "The Selection of Foods for Between-Meal Feeding in Industry," *Journal of American Dietetic Association,* vol. 17, October 1941, pp. 753-758.

Mayers, May R. "Kinds of Food for Proper Nutrition of War Workers Prescribed," *Industrial Bulletin* (New York), vol. 21, September 1942, pp. 300-302.

Mayers, May R. "Problem of Adequate Nutrition for War Industrial Workers," *Industrial Bulletin* (New York), vol. 21, June 1942, p. 232.

Milbank Memorial Fund. *Proceedings of Twentieth Annual Conference*, "Nutrition in Industry," pp. 9-43. New York, May 7, 1942.

National Research Council, Committee on Nutrition in Industry. *The Food and Nutrition of Industrial Workers in Wartime.* Washington, 1942. 17 pp.

Phipard, Esther F. "How Good Is Our National Diet?" *Annals of the American Academy of Political and Social Science*, vol. 225, January 1943, pp. 66-71.

Stiebeling, Hazel K. *Are We Well Fed? A Report on the Diets of Families in the United States.* U. S. Department of Agriculture, Bureau of Home Economics. Misc. Publ. 430. Washington, 1941. 28 pp.

U. S. Food Distribution Administration, Nutrition and Food Conservation Branch. *Manual of Industrial Nutrition.* Washington, 1943. 25 pp.

——— *Planning Meals for Industrial Workers.* Washington, 1943. 28 pp.

Urquhart, Lewis K. "Right Food for War Workers," *Factory Management and Maintenance*, vol. 100, October 1942, pp. 87-89.

9. Study and expand the safety program to adapt it to women workers, and instruct women thoroughly in safe work practice. [21]

The safety of women workers in shipyards depends on full protection of all the workers. It rests, therefore, on good yard maintenance and safety engineering; on thorough and periodic investigation into physical, chemical, dust, and other hazards and as early and complete control of these as possible; on concentrated and continuing education and careful supervision of every worker in regard to safe practice; on complete provision of the basic facilities for safety, such as impact and antiflash goggles, hard hats, respirators, portable ventilation equipment, easily accessible hot and cold water and soap and towels, and sterilization service for personal protective equipment passed from worker to worker.

A bulletin, *Minimum Requirements for Safety and Industrial Health in Contract Shipyards,* published early in 1943 under the authority of the United States Navy Department and Maritime Commission, covers the field thoroughly. If the simple, direct, and authoritative recommendations made in this bulletin were carried out in each of this country's shipyards, accidents and illnesses arising from shipbuilding employment probably would fall to an irreducible minimum.

A large share of the difficulty, of course, has been the need for putting good practices into effect under the weight of introducing great numbers of inexperienced workers to be guided by inexperienced supervisors in a fast expanding organization pressed for high production. The result has been ignorance of safety rules, methods, and procedures as well as sheer negligence and lack of observance of safety fundamentals all too well understood.

In order to control and work toward the remedy of this situation, it is strongly recommended that the services of the consultants on safety and health of the Navy and Maritime Commis-

[21] This section of the report was prepared by Jennie Mohr.

sion under Philip Drinker and John M. Roche be utilized fully, as well as the resources and special offerings of the National Committee for the Conservation of Manpower in War Industries. To be stressed particularly among these special offerings is the standard basic course on the fundamental principles and techniques of industrial safety and health sponsored by 116 colleges of engineering throughout the country through funds provided under the Engineering, Science, Management War Training Program of the United States Office of Education. The Division of Labor Standards of the United States Department of Labor prepares special text material for the classes and compiles other reference sources to be purchased by students or for them by management. National Committee agents and representatives of the sponsoring colleges enroll the students, on the recommendation of plant management. The standard basic course offered in evening classes for 96 hours over a period of 16 weeks is designed primarily for work supervisors and counselors but has proved very valuable also to line workers.[22] It is of course particularly important that men and women supervisors attend, for, as one safety engineer sagely remarked, "The greatest hazard in the industry is the lack of trained supervisors." But as many employees as possible, men and women, also should be encouraged to enroll in the nearest class, thereby affording those in the ranks as well as supervisors a good concept of fundamental principles on which safe practice depends, in addition to the rules and precepts derived from such principles.

Safety instruction.

The unfamiliarity of the women in shipyards with industry and with shipbuilding in particular makes it imperative that they be given as complete introduction as possible to the specific hazards of their unaccustomed employment and to the approved methods by which to meet such hazards.

The need for safety training during the induction period has been pointed out (see page 52). This training should be designed primarily to serve two purposes: to acquaint the women with the conditions they will meet, and to give them some preparation for meeting them. One successful experiment is the training course set up in Oakland, Calif., by the Vocational Training Division of the United States Office of Education, a job introduction course for women shipyard workers. (See page 25.) This 5-day (40-hour) course is carried on in an environment that duplicates certain of the conditions of a ship. Women learn here how to climb staging, how to lift and carry weights, and how to handle tools and equipment. The noise and the apparent confusion are like those they will later encounter on the job. By the end of the training period, they have some practical knowledge of what working in a yard may be like. By such means, the first sharp edge

[22] See pamphlet describing the program and course, *Training Safety Leaders*, U. S. Department of Labor, Division of Labor Standards. 1943. 18 pp.

of fear is removed. The women see the practical implications of safe and unsafe practices. They are in some degree ready to take their place on production.

Though such a comprehensive preliminary course may not be possible in all cases, the induction program still can be effective in preparing the women for the job. Visual aids such as safety films and posters help to make instruction more vivid and persuasive. Sources of such visual aids have been listed on page 55. In addition, the National Safety Council has a series of posters, sound films, and slide films that are extremely useful in safety education. Certain of this material pertains specifically to training women workers.

Safety instruction in the induction period, however, is only a beginning. It must be carried on constantly by those directly responsible for the supervision of the women. There is little dispute, among those familiar with the field and having a knowledge of shipyard needs and conditions, about the specific standards or techniques that should be stressed in safety training. But there are very great differences in the degree of success with which these standards and techniques are maintained in the ordinary course of work.

The basic training courses referred to previously are the first-line attack on the problem of creating a safety-trained supervisory force. Such preparation should, however, be followed up by further training programs and by continuing conferences between the yard safety engineer and the instructors and work leaders responsible for teaching safe work practices.

The need for supervisors trained in safety relates, of course, to all workers, men and women alike. But there is the additional question of the specific ways in which women's special needs are involved. The differences in strength and physical structure between men and women must always be remembered as possibly giving rise to differences in the extent to which a particular job is a hazard to the worker. Such variations should be called to the attention of the supervisors. The women counselors can be of assistance in this respect by pointing out problems as they arise, and helping in their solution.

Safety on the job and inspection.

There is much to be said for the adage that the best way to learn is by doing. Safety awareness should be part of every man's and woman's job, whatever that job is. To attain that universal safety awareness in the yard, all the workers should actively participate in the safety program. Listening to safety instructions and looking at safety posters are not enough. Women workers should take an active part in safety committees. They should concern themselves both with the general conditions that affect all the workers alike and with their own special safety needs. By taking on responsibility for the setting up of safety standards and for enforcing them among themselves, the women will develop

both understanding and experience in handling safety problems.

In an industry such as shipbuilding, in which hazards are great, a large proportion of workers are new to the work, and turn-over is high, it is not easy to obtain such self-discipline in matters of safety practices. It is not always possible to keep safety training of the supervisors and workers up to the necessary standards, in either number trained or quality of skill achieved. It may therefore be necessary, as an emergency measure, to enlarge the safety department by increasing the number of inspectors. These inspectors should be adequately trained, according to standards laid down by authorities in the field of safety training. They should be competent to recognize hazards, whether they are technical questions of plant and machine structure, inherent in the lay-out of the plant or work, condition of equipment, or growing out of the practices of individual workers; they should be able to indicate what corrections are needed, and to evaluate the changes made in order to be sure that the hazards are removed.

Women have proved their capacity for safety inspection if properly trained. They are acknowledged not only to be safety-minded, but to give considerable attention to detail. They should be trained as men are trained to take up the work of safety inspection. Like the men, they should be in the regular safety department, and they should be responsible for the same type of inspection as are the men.

It is not advisable to create a separate group of "women safety inspectors," as has been done in some of the yards, who are concerned with safety problems in the yard only as they relate to women. Such a practice makes a false distinction, in separating inspectors by function, by status, or by sex. It fails to integrate the women into the total safety program of the yard, and such integration is essential if the program is to succeed. Furthermore, it has been found in some yards that these special women inspectors take on some of the duties of women counselors, if the function of the latter is not clearly defined or they do not cover the yard. This, too, is inadvisable. While the closest cooperation must exist between safety inspectors and counselors, their functions should not be confused.

Seating.

In shipyard work, even more than in many other industries, the problem of constant standing confronts the woman worker. Many of the yard jobs also involve climbing, walking, and carrying. The general physical lay-out of the yard and the large amount of outdoor work seem to preclude the possibility of making shipyard work anything but a stand-up job.

It is recognized generally that constant standing is bad for women. Besides the fact that their feet and legs tire quickly (with brief periods of rest recovery also is quick), permanent and even serious effects may result. For this reason it is desirable that wherever possible seats should be provided for women.

There are several ways in which some measure of suitable seating can be achieved. A number of jobs that are frequently performed standing can be done seated just as well. Operation of drill presses, punch presses, and similar machines in the machine shop can be carried on either sitting or standing. Cleaning small parts for painting, coil winding, bench assembly work, grinding and finishing operations also can be done in either position. For all such jobs it is recommended that seats be made available, and that women be allowed to alternate sitting and standing. Such alternation is more desirable, and less fatiguing, than working in either position constantly.

Women on jobs that require standing or walking and cannot be done while seated should have a chance to sit down occasionally. When they are at machines that require standing, seats should be provided for occasional pauses. When they are working out-of-doors, on ships or hulls, they should be able to go in their rest periods to some place that has comfortable seats.

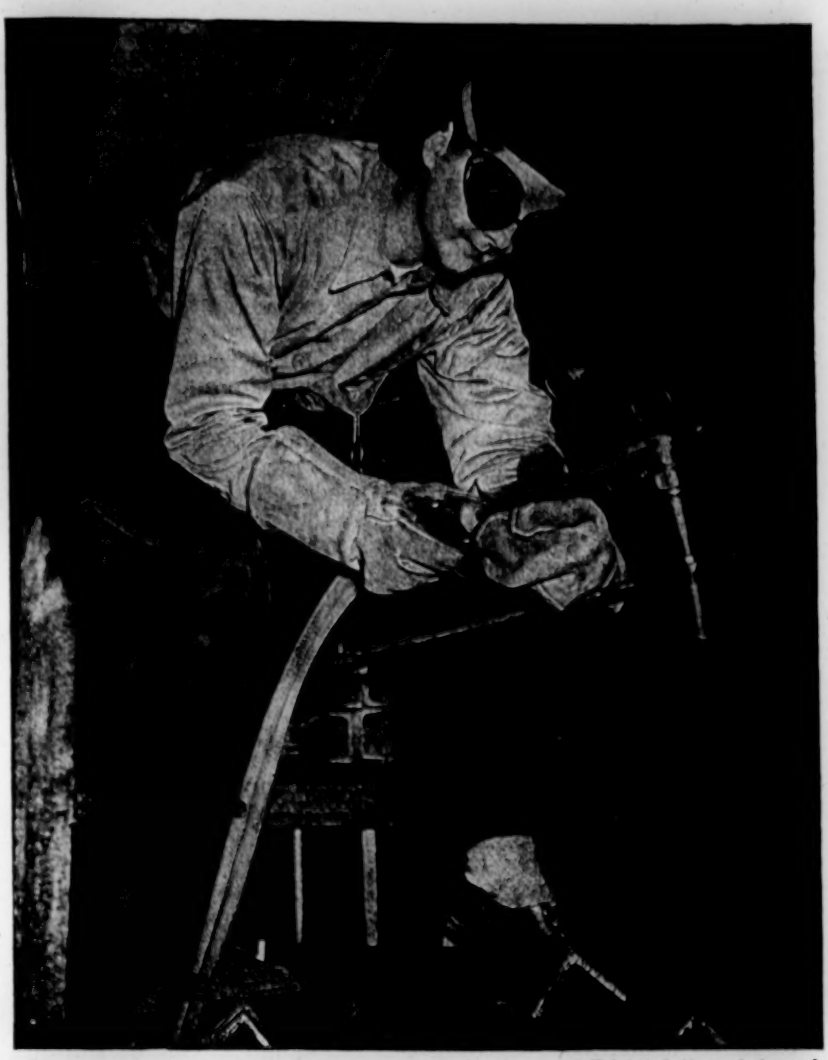
In a number of the yards visited there were seats for some of the women. For the most part, however, these seats filled none of the requirements for good posture chairs. Few yards even had stools—and fewer still had chairs with backs. For the most part women were sitting, if at all, on boxes, up-ended crates, barrels—anything around the place that could be used. Such seats were in some cases more tiring than no seats at all, especially if the job was done sitting all the time.

It is possible, of course, to sit correctly on anything. But this requires instruction in good posture, which is almost always lacking. It also requires considerable muscular effort, in itself fatiguing. The instruction should certainly be given, preferably as part of the induction program. But workers should also be given seats that enable them to sit correctly without unnecessary effort. Jobs should be studied to see whether it is possible for them to be done in a sitting position. Work materials should be arranged when possible to produce the most efficient techniques of handling, and avoid superfluous motions, such as reaching, stretching, bending.

The need for good seats and good posture is discussed in the Women's Bureau bulletin, "Women's Effective War Work Requires Good Posture." Many of the suggestions made there can be carried out even in a shipyard. And a constructive effort to give women opportunities for good seating will contribute noticeably to their efficiency and health.

Safe clothing.

The question of the right clothing—that is to say, the safe clothing—for women to wear in the shipyard is probably one of the major aspects of their safety needs. Nine percent of the injuries in 11 shipyards reported in 1941 to the Bureau of Labor Statistics occurred as a direct consequence of failure to use safe attire. When women were first employed to work in shipyards



Official U. S. Navy photograph

Women Burner Is Shown Burning Through a Steel Bar as She Helps to Build and Repair Ships for the Navy.

there was little in the way of precedent to follow in suggesting to them the safe clothing for the job. Extensive variation in their work, moreover, made uniform clothing regulations unfeasible. Clothing needs of welders are different from those of burners, and both differ from the needs of shipfitter helpers on the platens or the sheet-metal workers in the shop.

During the induction period women should be told what are the fundamental principles by which safe clothing may be selected.

A brief description of yard regulations and references to the handbook, where one is issued, is not enough. Instead, each safety feature of recommended types of work garments should be pointed out and related to work conditions. Samples of good selections should be shown and safety aspects especially pertinent to certain jobs described. With this information, women will be in a position to choose correctly, from a selection of garments, apparel that suits their individual taste and pocketbook and at the same time meets the safety needs of their jobs. They will learn also when and on what jobs to wear gloves and what kind, in what places and occupations steel-toe safety shoes are obligatory and where comfortable but substantial oxfords without safety construction may be worn. Such knowledge makes unnecessary more than a minimum of supervision and makes possible the maximum of conformity to basic safety standards.

Various models of suitable clothing have been developed for different types of work. Some of them have resulted from manufacturers' response to the general need; others have been produced by professional designers engaged by individual firms. The American Standards Association has recently established standards for a variety of women's work clothing, including shirts, jackets, shoes, slacks, dungarees, overalls, and coveralls.[23] Standards for welding clothes, for both men and women, are in process of development.[23] Clothing that is recommended to the women should be that made by manufacturers who follow American Standards Association specifications.

Both oxfords and high safety shoes that meet accepted standards are now made by a number of manufacturers. The high shoes are particularly necessary to welders to protect their ankles against burns.

Shipyard work raises some clothing problems that women encounter in relatively few industries. For one thing, much of the work is out-of-doors, and workers are exposed to the extremes of weather, ranging from the heat of a New Orleans summer to the intense cold of a Maine winter. Also, there is a good deal of climbing to be done on many of the jobs, and almost all the women encounter the confusing array of supplies and parts throughout the yard that offer innumerable bars, corners, pipes, and other hazards on which loose clothing can get caught. One of the difficulties in many yards visited by Women's Bureau agents was that of finding outdoor apparel that would be warm enough for protection but tight-fitting enough not to be a hazard in climbing staging or ladders, or working around piled materials in the yard. Another, still largely unsolved, is finding welders' and burners' apparel that while fully protective is cool enough for comfortable wear in hot weather.

In the induction period or as soon after as possible, it is necessary to teach the new women workers about the occasions and occupations for which special protective equipment is needed, and

[23] Consult the American Standards Association, 29 W. Thirty-ninth Street, New York, for further information.

why and how such equipment must be used. By the time they are ready to take an active part in production, therefore, the women should know when and where to wear goggles and where goggles are issued, where a hard hat is necessary gear, and, if necessary, when to use and how to secure and adjust a respirator. Those entering welders' or burners' training should receive, with their instruction in techniques, early and continuous indoctrination in the safe way to do their work—the precautions they must take to prevent injury to themselves and others, and the protective equipment they must wear.

Women welders and welder helpers.

A large number of women shipyard workers are welders. The tabulation on page 21 indicates that 36 percent of the women in 24 yards were in shipfitting. Most of these were welders or burners, or helpers in these skills. Thus the safety requirements in the field of welding are especially significant for women workers.

On the whole, the hazards to women in welding are not different from those to men. Numerous thorough analyses of these hazards have been made, and standards have been set up for controlling them. These standards, issued by such authorities as the Maritime Commission, the Navy, the National Bureau of Standards, the American Standards Association, and the Division of Labor Standards of the Department of Labor, cover welding equipment, conditions of work, protective clothing and apparatus, and working methods. They stress, for example, the need for suitable eye protection, helmets, and respirators to be furnished the worker, and the equal need for the worker to use them properly and consistently.

There are a few elements in the welding job that should be recognized as a particular concern of women. One of these is the weight of welding leads and other equipment carried around by women welders or welder helpers. The leads, which may weigh as much as 35 pounds, must be carried up and down ladders, through crowded areas, and into compartments often difficult of access. It is important, therefore, that the helper to whom this task is assigned should be chosen for her physical ability to do a strenuous job. She should be taught the most economical way in which to coil, lift, and carry the leads. (See page 53.) She should be a person with enough agility to get around in crowded places.

A difficulty sometimes reported by women welders with small hands is that of manipulating welding tongs. Some manufacturers of welding equipment have experimented with slenderizing tongs, so that the grip will be easier for a small hand. Such tongs, however, require increased pressure in order to open the jaws and release the rod, as must be done frequently in welding. Further experiments are being made in lengthening the tongs in order to increase the leverage and decrease the amount of pressure needed. These slender tongs are said to be too light for some welding jobs, though probably they could be used on many of the lighter jobs to which women are predominantly assigned.

The question has been raised whether or not women are more susceptible than men to the fumes, gases, and vapors of welding. No conclusive evidence on this point exists. However, a study now being made by the United States Public Health Service for the Maritime Commission will furnish data on many problems by sex of welder. If there is a difference in reaction between men and women, it may be expected that this survey will reveal it.

The rumor is rife in some shipyards that arc welding produces sterility in women, and in some instances women refuse to enter or remain in this occupation for that reason. Available medical opinion indicates that there is no foundation in fact for this rumor. An analysis of the subject published in the Journal of the American Medical Association in 1939 (Volume 113, No. 7, page 616) points out that neither the nitrogen compounds created in the welding process nor the ultraviolet rays of the arc—two factors that have been most responsible for the rumor—are capable of producing sterility. Industrial physicians who have been closely concerned with the health of welders, as well as physicians outside of industry, agree on this point.

Cooperation v. regimentation.

Every good safety program rests on the acceptance and understanding of the workers to whom it applies. Certain requirements, such as safe machinery, adequate guards, rails around cat-walks, and other plant equipment, can be built into the operating procedures. But many other requirements depend for their satisfaction on the workers themselves. Safety shoes, hard hats, and goggles must be supplied; but it does no good to supply them if they are not worn consistently where and when they are needed.

For many women new to industry, achieving a conviction about the need for safe practices and safe apparel is not simple. As far as clothes are concerned, they have inherited a long and firmly established tradition, which uses various criteria, among which safety is not numbered, in setting clothes fashions. The idea of safety as such a criterion must be accepted before adequate clothing standards will be adhered to. It can be instilled by means of a good educational program, but it cannot be forced upon them.

Clothing regulations can be most easily carried out if they deal with only those features having to do with safety and suitability on the job. It is not necessary to insist that all women be dressed exactly alike, in the same style and color, and many women resent the imposition of such regimentation on them while the men with whom they work are free of it. Rules such as one requiring the wearing of a hard hat, safety shoes, or goggles are applicable to every worker, regardless of sex, and if they can be made clear and unequivocal during the induction period, they will be taken for granted and followed.

Women are willing to cooperate when such regulations obviously are reasonable and necessary. But even a reasonable rule will appear arbitrary and will be resisted if its reason is not

explained. Moreover, when rules are imposed beyond the limitations of their need, as when women entirely removed from any machinery must take off their wedding rings, or when the entire force of women is required to wear a given color, they lose their value for building good safety awareness and the cooperation without which no safety program can succeed.

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APPENDIX

Women's Occupations in 35 Shipyards

(Women's Bureau survey)

Acetylene-burner operator and helper (hand burner)
Arbor-press operator
Asbestos filler and sewer
Asbestos layer-out and cutter
Assembly worker, bench and other
Assemble valves, couplings, waterpumps, Diesel engines, manifolds, metal furniture, locks, water tanks, ammunition boxes, lockers, rifle cabinets, switchboards, stanchion parts, ammunition-hoist parts, stiffeners, parts for watertight doors and hatches.
Assemble also straps, hangers, fittings for electric-wiring systems, conduit pipe, brackets, lamps, drop lights, small switches, and telephones.
In one yard women assemblers file surfaces to true, fit gears to shafts, and make subassemblies. Some are so proficient as to make the assembly for an entire unit, such as the mechanism controlling the training of a gun.
Band-saw-machine operator
Battery filler and tester
Battery reader
Bead-machine operator
Bench-lathe operator
Bench worker
Perform such operations as filing, burring, hammering, brazing, soldering, hand tapping, dimpling, hand forming of metal into various shapes, heating metal with gas torch, and rolling metal into cylindrical shapes. Other work consists of making hangers for putting up wires and cables, engraving of dials, name plates, tags, etc., and removing parts from electrical connection boxes.
Women also calibrate instruments, hand-lap parts, and punch, stamp, bend, drill, grind, file, and polish parts in the sheet-metal shop.
Bending-roll operator (cold press and mangle roll)
Binder
Blacksmith helper
Hold and fetch tools; operate lever of a pneumatic press.
Blade straightener
Boatbuilder helper
Hold and fetch tools; hammer and saw.
Boiler builder
Boilermaker helper
Bolt-cutting-and-threading-machine operator
Bolt-threading-machine operator
Bracket-tipping-machine operator
Braiding-machine operator
Brake-machine operator
Brazer
Bucker-up (sheet metal and steel)
Cable finisher
Cable stripper, hand and machine
Calker (on wooden boats), trainee
Canvas worker
Carpenter or shipwright helper
Castings cleaner (with grinding wheel)
Chain-ladder maker
Chromium plater
Circular-saw-machine operator
Cleaner (ship, shop, tank, yard)
Clerical work, shop

Time clerks, dispatchers, expediters, material checkers, blueprint clerks, mail girls, messengers, materials-control clerks, storekeepers, shipping clerks.

Coppersmith helper
Core cleaner
Coremaker and helper
Women were making only the smaller and lighter-weight cores, but helping on the large ones.
Crane operator, electric overhead and electric portable
On cranes with capacity of from 3 up to and including 100 tons.
Crane safety watcher
Cushion man
Cut-off-saw-machine operator (metal bar stock, bolts, cable)
Cut-off-saw-machine operator (wood)
Cutter, hand (sheet metal)
Cutting-machine operator (cloth)
Cutting-machine operator (metal)

Deckhand
On 50-foot boat plying between yard and nearby repair base.
Die-sinking-machine operator
Dipper
Do-all-saw-machine operator
Drill-press operator, single and multiple spindle
Driller, hand
Driver (automobile, bus, jitney, truck; panel, mail, or station wagon)
A few women were driving electric trucks inside the shops. Most were operating gasoline vehicles outside.
Drop-hammer operator
Operate controls and hold dies in place. Do not lift metal stock.

Elbow maker
Electrician, journeyman and helper
Elevator operator
Embossing-machine operator
Engine-lathe operator
Engraver, flatware
Engraving-machine operator
Escort
Fire watch
Flag maker; beading preparation and sewing
Flanging-press operator and helper
Folding-and-perforating-machine operator
Forelady (print shop)
Forming-press operator
Furnace tender

Garage service attendant
Gardener
Gasket cutter
Gear-cutting-machine operator
Generator operator
Glasscutter and grinder
Grinding-machine operator (dry and wet; cylindrical, internal or surface with magnetic chuck)
Grinding-machine operator (portable)
Guard
Look over credentials at the gate; patrol yard and shops. Some are sworn in as Coast Guard auxiliaries and carry weapons.

Hydraulic-press operator (automatic)
Inspector (machine shop)
Jointer-machine operator
Kick-press operator
Labeler, hand

Laboratory assistant
Chemical analysis; materials testing; sand control in the foundry.
Laborer, miscellaneous process
Laborer, service and maintenance
Maintenance and repair on buildings and grounds, i. e., repair and maintain extension lights; change street-light globes; clean out manholes; put in telephone and light wires; oil electric heaters and fans in all buildings; clean, help install, repair, test switchboards and telephone instruments; cover pipes; make towel boxes; fill in ditches; fire watch in buildings; salvage and bale paper; clean smudge pots after air-raid alarms; wash heavy rubber cables and help roll them up; etc.
Laundry service attendant
Layer-out and helper
Lead liner
Lead-press operator
Leadwoman
Loftsman helper
Machinist (armature) and helper
Masker
Milling-machine operator
Milling-machine operator (portable)
Net maker
Nibbler operator
Nipple-machine operator
Oxyacetylene-cutting-machine operator (machine burner)
Packer
Paint grinder
Paint maker
Paint-shop attendant
Painter, brush and helper
Painter, radium dial
Painter, sign and poster
Painter, spray and helper
Pantograph operator
Pattern maker helper
Pickling operator
Pipe bender, machine and hand, and helper
Pipe coverer and helper
Pipefitter and helper
Pipe tapper
Pipe tester
Pipe-threading-machine operator
Planer operator, metal
Planer operator, wood
Plumber helper
Pneumatic-drill operator and helper
Some women were operating pneumatic drills of large size.
Powerhouse engineer helper
Power-shear operator
Punch-press operator
Putty chaser
Quarterman (flag and sail loft)
Radial-drill operator
Repairman
Repair and assemble telephones; disassemble, clean, repair, reassemble, and calibrate such instruments and meters as tachometer motors, thermostatic contact makers, hydrogen detectors for submarines, shaft revolution indicators, heat and pressure gages, and compasses.
Repair lanterns, tools, motors, breathing apparatus for fire fighting, valves, chains, pulleys; disassemble, clean, repair, reassemble, and aline optical parts of telescopes, gun sights, binoculars, navigation instruments,

range finders; repair patterns after use in foundry; repair old life jackets. One woman repairs sewing machines.
Rest-room attendant
Rigger helper
Rivet catcher
Rivet heater and passer
Riveter and helper
Rod straightener
Rope worker
Rope-machine tender

Salvage man
Sandblaster
Sander, hand
Sander, machine
Scaler, hand
Scaler, machine
Scraper, hand
Screw-machine operator, automatic
Sewer, hand
Sewing-machine operator
Shaper operator
Shearing-, punching-, and cutting-press operator (combination)
Sheet-metal worker and helper
Shipfitter and helper (none are journeymen)
Slitting-machine operator
Slotting-machine operator
Snapper (working supervisor)
Solderer
Splicer, rope or cable
Stapler
Steel checker
Steel-storage-shed attendant
Stenciler
Stockroom attendant

Tapper, hand
Template maker and helper and learner (hull, pipe, and electrical)
Tester and helper
On valves, electrical equipment, buckets.
Threading-machine operator
Toolroom attendant
Tool grinder
Tracer
Trimmer, rubber
Tufting-machine operator
Turning-lathe operator (wood working)
Turret-lathe operator
Turret-punch-press operator

Upholsterer
Unscrewing-machine operator

Varnisher
Vulcanizer

Watchman
Shipkeepers, going rounds of ships.
Weld checker
Weld chipper
With light pneumatic chipping tool.
Welder, acetylene
Welder, arc (production, tack, helper and trainee)
Welder, spot
Welding-machine operator (union melt and other)
Winder, coil and armature

Wire brushman
Wire-stripping-machine operator
Wood finisher
Wood-plug-making-machine operator

Women's Occupations on the Ships and Hulls in 19 Shipyards

(Women's Bureau survey)

Acetylene-burner operator and helper (hand burner)

Bucker-up

In connection with cold riveting and sealing steel partitions in one yard. On small rivets in another.

Cleaner

In one yard women clean off tops of boilers on board ship, sometimes at a temperature of 140 degrees.

Ship cleaning may involve picking up or sweeping up bolts, screws, etc., putting them in pails and lowering them over the sides of the hull; sweeping, mopping, and washing the ship interior, preparatory to painting and after all fitting has been done; or cleaning up in holds, under engines, in bilges, tanks and the like. It requires a good deal of climbing, crawling in narrow places, working in pipe alley, shaft alley, galleries, bomb storage, etc. The cleaners may have to haul full buckets of scrap up and down several decks with ropes. Tank cleaners must climb into the holds of ships and submarines and use scaling guns and wire brushes, as well as cleaning solvents and water.

Clerical worker, ship

Take care of plans in ship offices. Run errands. Keep records of wiring systems being installed.

Electrician helper

Help electricians to install switches, lights, telephones, switchboards, instruments, fuse boxes. One woman is able to make entire telephone installation alone except for assistance of another woman who acts as her helper. It had taken her two to three months to learn this.

Follow up lay-out men, making sketches of how installations are to be made.

Cut wires for lights and switchboxes, skin armor off cables; put lugs on end of wires; run through cables and strap them up.

Stencil and put identification tags on cables.

Test wires, motors, thermometers of ventilating sets.

Help pack tubes.

Take battery readings on submarines.

Get material and supplies for electricians.

Fire watch

For welders and burners and on ships under repair, as well as construction.

The fire hazard to welders and burners is great on submarine and ship repair work because of the grease, oil, and old paint that are present.

The fire watch is assigned, therefore, to an individual welder or burner to put out any fires that may flare up, watch that something does not burn on the other side of a plate being welded, pick up any inflammable material lying around, and carry equipment and material for her mechanic.

The fire watch on new construction goes all over the ship checking for fire hazards, or she may be assigned to check the ways, scaffolding, and grounds. She does not work with any one welder or burner.

Grinding-machine operator (electric hand grinder)

One woman was grinding down surface of deck with this machine, preparatory to putting on armor plate. The tool used was heavy, requiring lying or sitting on deck.

Laborer, service and miscellaneous process

Shovel sand and residual material in bottom of drydock.

Sort temporary bolts, nuts, clips in bottom of drydock.

Measure lengths of cable and cut them by machine.
Take masking off doors and other fixtures in cabins.
File off edges of pipes installed as hand rails.

Machinist helper
Tighten small bolts; scrape flanges; clean parts; pass tools and equipment.
Assist machinists in installation work.
Perform small jobs with saws, files, drill presses.

Masker
Cover furniture, lights, etc., with masking tape preparatory to spray or brush painting.

Milling-machine operator (portable)
Operate portable milling machine to prepare bases for installation of machinery.

Painter, brush and helper
Brush paint on interior of ship after fitting is completed and ship has been cleaned.
Helpers mark parts for painting and clean surfaces preparatory to painting. Some pass "hot stuff" (bitumastic) to painters.

Painter, spray
In one yard women do some spray painting on the ships.

Pipe coverer
Wrap pipes with a spun glass tape that keeps asbestos covering tight.

Plumber helper

Rigger helper
Assist in putting up rope life lines and help in other ways such as fetching and carrying.

Rivet catcher

Rivet heater and passer
Use electric heater; pass the smaller rivets.

Riveter and helper
In one yard women riveted on steel partitions.
In another yard women helped riveters by carrying rivet guns.

Sandblaster
Women in one yard are sandblasting on the outsides of ships in drydock. They fill the sandblasting machines, operate the controls and hold the hose for the actual sandblasting operation. They wear oilskin suits, face shields, and respirators, all of which are provided by the yard.

Scaler, hand and machine
The scaling guns used in machine scaling require considerable physical strength to operate and produce various amounts of noise and vibration depending on the size of the tool. Scaling on ships and submarines when done below deck involves working in narrow quarters where the noise is accentuated. In one yard women were doing a great deal of scaling on submarines.
Hand scaling is done with a hand chipping tool. This is easier and more suitable work for women.

Sheet-metal worker helper
Assist men in the installation of ventilating systems, lockers, metal furniture, etc. They get material and supplies for the sheet-metal workers, drill holes, put in screws and bolts, buck small rivets, and hold parts in place that are being bolted up by men.
Check to be sure that the proper pieces of sheet metal are available at the right place on the boat and indicate to the sheet-metal workers where each piece is to be installed.

Shipfitter helper
Run errands for shipfitters; carry tools, equipment, and materials; bolt up plates; hold plates in place for welders; drive wedges to hold plates in place; mark parts to be taken off ship, indicating where they go (on repair jobs).

Snapper

A woman welder in one yard was bossing a group of 12 women doing overhead welding in a ship conversion job.

Toolroom attendant

Check air pressure for drillers and riveters and act as tool attendant for them.

Check motors in and out.

Pick up orders for ventilation in compartments and carry them to those who provide the ventilation.

Watchman

Go the rounds of ships, punching clocks. Some on both day and night duty.

Welder, arc, and helper (production and tack)

Women are known to be on all decks of ships on the hulls and at outfitting docks and deep in the holds as well. Women in one yard volunteer to weld from scaffolding on the sides of the hulls. Women hired as welder helpers roll up and sometimes carry around leads for welders.

Wire brushman

Brushes used vary in size from 2 to 15 pounds.

The work involves considerable vibration and torque and the necessity for working in awkward positions that sometimes require holding the tool at shoulder height.

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, SECRETARY
WOMEN'S BUREAU
MARY ANDERSON, DIRECTOR

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Women's Employment in Foundries, 1943

By
FRANCES E. P. HARNISH

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Women's Employment in Foundries, 1943

FOUNDRIES VISITED

During the second half of 1943, representatives of the Women's Bureau of the United States Department of Labor visited eastern and middlewestern foundries in connection with studies the Bureau was making of the utilization of women in the heavy metal-working industries. Some of the foundries were a part of good-sized machine-tool establishments, and some, though engaged primarily in foundry work, had small machine-tool production departments; the majority, however, did no machine-tool work other than that required for maintenance.

In the foundries visited most of the castings were being made of steel, but some foundries were also making cast-iron and malleable-iron castings. One, which specialized in making steel castings, also had a smaller foundry where brass castings were made, and here, the parts handled being smaller, more women were used than in its steel foundry. Another foundry made castings entirely of aluminum or zinc and differed from all the others in that it used the die-casting process.

This report will be confined to women's work in the foundry itself, excluding separate machine-tool divisions and the office, maintenance, and service departments. Plant statistics made it impossible to arrive at figures with exactness—for example, in some cases there were employees who did maintenance work as well as production—but inconsistencies probably are slight. Women in appreciable numbers were employed in the administrative offices and in plant clerical work, and a few were in maintenance and service, though as recently as 1 or 2 years ago the firms employed practically no women in any capacity.

While most of the foundries were job-production plants, they had war orders that called for a certain amount of production of a repetitive nature. A few of the foundries produced small as well as large castings. The wide range of products made by the companies visited included castings for the following: Locomotives, turrets for tanks and gun carriages, gun mounts, leveling sockets for guns, elevator parts for airplane carriers, armor for tanks, tank hulls and housings, hydraulic presses, rolling-mill machinery for steel mills, large parts for machine-tool builders, ships' parts, towing and hoisting equipment, various parts for trucks, tanks, and torpedo boats, turbo superchargers, valves and fittings, various smaller parts for machines, and ordnance and ammunition components.

EXTENT OF THE USE OF WOMEN AND FACTORS INFLUENCING SUCH USE

The foundries studied differed in size and in the type of work being done. The plants (excluding, as already explained, those sections not

directly connected with the foundries) ranged in total employment from 254 to 5,275 workers, and in number of women employed from 4 to 819. Of a total of 22,622 workers in the foundries covered, excluding all clerical workers, 3,631 of the workers, or 16 percent, were women. The percentage of women in these various foundries ranged from 1.6 percent to 43.4 percent. The foundry with the greatest total employment (5,275) employed only 10.8 percent women, and the one with the greatest percentage of women (43.4) had a total employment of only 495 persons.

Obviously, the proportion of women did not depend on size of foundry. Instead, it depended in varying degree on such factors as the shortage of male workers in the labor market; the size of the castings that were being made; and the extent to which the foundry was engaged in job or production work. Probably male-labor shortage was the chief determining factor, for while some of the plants visited that made very large castings required weight-lifting which, they believed, could not be eliminated, other plants broke down similar jobs to permit the use of more women where there was a great shortage of male labor. Foundries engaged largely in job work, sometimes making no more than one casting from a pattern, could not utilize "green workers" so easily as production foundries where some of the jobs could be broken down to utilize unskilled workers on mass production or repetitive work. Due to the labor market, some of the foundries were using women on jobs not really suitable for women, and others were not utilizing women to any degree though they could have employed them in many suitable jobs.

Some foundries mentioned the fact that they could use more "green help" (or women) if they were able to secure more skilled workers. Men have been avoiding foundry work and therefore in many foundries there are too few skilled workers available to keep production up to capacity. It is easier for foundries operating to capacity and using a large force of workers to utilize women, because these foundries can often subdivide jobs so that some of the weight-lifting and strain incidental to many of the jobs can be removed and so that some jobs or parts of jobs can be done by unskilled workers (dilution of skills).

It was not always true that the foundries with the most favorable working conditions and the most modern labor-saving equipment made the greatest use of women. The foundries visited presented great contrasts in working conditions or general environment.

DESCRIPTION OF FOUNDRY WORK AND WOMEN'S WORK IN FOUNDRIES

A foundry is that branch of the metal-working industry in which an object of metal is made by pouring molten metal into a mold of the desired shape. The metal solidifies and is called a casting. The casting, though given a preliminary cleaning and finishing in the foundry, usually is the rough piece of metal on which fashioning is done in machine shops.

If the casting made in the foundry is to have a hollow interior, a form in the desired shape of the hollow interior is made. This is called a core. The core is inserted in the mold so that the metal flowing into the mold flows around the core.

Cores and molds are made, generally speaking, of a mixture of sand, clay, and a fluid binder. Different formulas are followed, depending on the size and shape of the casting and the metal to be used. Less frequently loam is used in place of sand in the formula, and sometimes molds and cores are made of a cement mixture. The mold and the core can be used for only one casting, except in the uncommon and limited die-casting process where the mold is made of metal and can be used over and over again. (See p. 12.) In this study most of the description of the various departments of a foundry will be confined to the typical foundry where the sand core and the mold must be destroyed after each casting is made.

The pages following give an abbreviated and simplified account of the work done in the production departments of a foundry, together with a summary of the types of work that women now are doing in the various departments in the foundries visited by the Women's Bureau. At the end of this section of the report (page 14) there is a list, by department, of the occupations filled by women in the 13 foundries surveyed, together with a table showing the distribution of women in the several departments in 6 of the foundries that had the most complete statistics (page 13).

The Patternmaking Department.

The pattern is the wooden (sometimes metal) form into which sand (or other material) is pressed to shape the core, or the wooden pattern around which sand is pressed to shape the depression in the mold. The pattern is not destroyed, as the core and mold are, but can be used over and over again. Pattern making is exacting and highly skilled work. Patternmakers in wood are skilled woodworkers, having, in addition to that skill, an understanding of mathematics and blueprint reading and a knowledge of casting problems, such as where molten metal should enter the mold for a particular type of casting, how much to allow for the shrinkage of the metal after it is poured, and where to mark the pattern for vents. The maker of metal patterns must be a skilled machinist.

The patternmaking shop usually is separate from the foundry. There is also a pattern storage room where patterns are received, classified, stored, and issued.

Work for Women.—In the foundries surveyed patternmakers had trained unskilled women helpers to clean, sand, letter, shellac, or paint wooden patterns, to attach the little fillets that are pasted on patterns to round off sharp corners where parts are joined, and to check or measure patterns against blueprints. Women were also used occasionally as helpers to metal patternmakers. They very readily do pattern-storage work where small rather than large patterns are involved.

The Coremaking Department.

The core, around which molten metal flows at pouring time, forms the interior of a hollow casting. The core is made separately from the mold and is inserted in the depression in the mold that shapes the outside of the casting. In some foundries both core and mold are made of cement, but in the usual foundry both core and mold are made of a special type of sand. When sand has been firmly packed into the

wooden core-pattern the pattern is turned over on a board or steel plate and tapped lightly with a mallet. It is then removed from the sand core, which retains the shape of the pattern. This will be half of a core, since cores usually are made in halves, to be joined after the cores are baked in ovens. A number of small cores can be turned out on one plate. The plates are then lifted to racks and later moved into the bake ovens.

After baking, each core is inspected, patched where required, and painted or given one of several types of coating. The parts of the core are pasted together or assembled. Women are generally said to be especially good at making the small cores because of their finger dexterity, which usually is superior to that of men.

Some cores are so large that the pattern is in sections, with sides that are bolted together and that later, after the core has been turned over, are removed one by one to release the core. The coremaker tamps in large quantities of the specially prepared sand. He uses bent steel wires called gaggers, or heavier rods, depending on the size of the core, as reinforcing inserts in the sand. With a wire or wax tapers the coremaker makes special openings for vents in the core. After the core box has been turned over on a plate, the core box is removed and the huge plate containing the core is set aside ready for the oven. Sometimes more than one man has to do the lifting, and hoists and conveyors also are used. Skill as well as strength is required for the making of large cores. Coremaking machines of various kinds are used to some extent in foundries but these machines do only part of the work of coremaking.

Work for Women.—In the foundries visited, a few women were making cores of the larger sizes, but this was production rather than job work and required less skill. A few women were operating coremaking machines.

Women were used as helpers throughout the core shops. They were doing such jobs as tending the ovens, sandpapering or finishing the baked cores, measuring and inspecting them, patching them by filling in rough edges with a putty-like mixture that dries in air, painting them or coating them with a silica wash. They were pasting the two halves of the core together or joining, by pasting, additional core sections, since on some complicated cores there are projections that have to be made separately and joined to the main body of the core after baking. The work of women on these relatively unskilled jobs is limited in extent if cores are large and if the foundry provides no help in lifting.

The Molding or Moldmaking Department.

Preparing the Mold.

The mold is the body or mass of sand containing the patterned cavity that determines the external shape of the casting. Molds, like cores, generally are made in halves, and these are fitted together after the core is set in. Molds may be made of cement but usually are made of sand. There is a four-sided container, sometimes of wood, sometimes of steel, called a flask, into which the sand is packed. The flask for the top half of the mold is called the cope and the flask for the bottom half is called the drag. The pattern for the cavity to be made in the sand is placed in the flask, specially prepared fine facing

sand is packed around the pattern, and coarse backing sand is then piled into the remainder of the flask as a support so that the mold will not break apart when the molten metal strikes it.

The sand or cement in the molds is reinforced with wires and rods and sometimes wire grills or arbors. Sometimes pieces of metal, called "chills," are placed against the pattern when the facing sand is being packed around the pattern, to regulate the cooling of the molten metal when it strikes the sand for castings whose parts are of unequal thickness. When the flask has been turned over, the flask for the second half of the mold is prepared like the first. After completion this is lifted from the pattern and is turned over. The pattern is then removed from the first flask.

In the process of moldmaking, the moldmaker makes an opening in the sand for the entrance of the metal and connects this, by molding and cutting a runway in the sand, with the patterned cavity in the mold. This entrance and pathway for the molten metal is called a "gate." The moldmaker also punches holes in the sand of the mold for vents to allow the escape of gases at pouring time. There is an additional section to the patterned cavity called the "riser," into which some of the molten metal may rise, at time of pouring, to allow for a supply of metal as the casting contracts while cooling. All extraneous parts of the casting, like the gates, the risers, and the fins (rough edges where the two parts of the mold are joined), must be removed from the casting later in the cleaning or finishing department.

The moldmaker and his helpers inspect and clean the patterned cavity in the sand, patch any broken sections, and strengthen the curved edges, in some of the larger molds, by inserting steel nails. Sometimes the molder applies a wash to the cavity and dries the sand of the cavity either by torch or in an oven.

After the core, properly supported, has been set into one completed half of the mold, the other completed half of the mold is placed over it and the two halves of the flask are bolted together. Sometimes the flask is removed before pouring.

Many foundries have machines to assist with the making of molds. The squeeze machine, which makes smaller molds, and the jarring, or jolting, or jolt-roll-over machines for larger molds, come in different sizes and types. In principle, however, they pack the sand in the flask and remove the pattern, and the roll-over machines also turn over the heavy flasks. There is more or less heavy work for the moldmakers using these machines, however. For instance, there is some lifting and turning of flasks on the squeeze machines and on the jolt-roll-over machines some tamping of top backing sand with pneumatic rammers, not to mention the sifting of facing sand over the pattern from sieves, or the shoveling of backing sand, hand work that sometimes is required of the machine molder.

In floor molding for the very large molds, workers may use long, heavy, vibrating pneumatic rammers to pack in the sand tightly. Some foundries have a sand-slinger machine that runs on tracks and ejects sand into these large molds with such force that the sand is made firm and compact. The operator of the sand-slinger machine may be a woman, but the worker who stands beside the mold and

pushes and pulls the heavy impelling head of the machine, from which the sand is forced into the mold, has work that is not only dirty but far too heavy for women. It is said that many of the men doing this work have acquired hernias.

Molds, when ready, are moved to the proper area for pouring. For the largest molds, pouring is done in the area on the floor, or in a pit, where the mold was made. Molds frequently are braced to prevent their breaking apart when the metal is poured. Very large molds may be braced with huge steel beams that are clamped to the tops, sides, and at the base of the mold.

There are five classes of molding:

(1) Bench molding, or the preparation of small and simple molds.
(2) Squeeze-machine molding. Some lifting is involved even on the smallest squeeze machines.
(3) Molding-machine or jar, jolt, roll-over, or jolt-roll-over machine molding for larger molds than those prepared by the squeeze machine.
(4) and (5) Floor molding for the largest molds. This includes side-floor molding and big (or main-) floor molding. Some of the largest castings are made in sunken pits.

Work for Women.—In some of the foundries surveyed, women were making bench molds. In others, they were acting mainly as helpers to the skilled moldmakers at machine molding, side-floor molding, main-floor molding, and pit molding. Some of the women helpers were little more than errand girls and laborers and some were doing rather skilled work, patching and helping with the fine finishing of the molds, or placing some of the small cores. In some of the foundries jobs were so broken down that the women, instead of doing a variety of work as helpers, specialized in such jobs as drying the mold cavities with gas torches, checking the size of the mold cavity, assembling arbors and straightening gaggers, and greasing "chills." A few women were operating the sand-slinger machine.

Preparing Sand for the Core and for the Mold.

In most cases exact formulas are followed for the preparation of the sand for coremaking and for the facing sand used in the molds. Different formulas may be followed for different jobs. Determining the formula and testing a sample of a prepared batch of sand-mix is a laboratory control job in many foundries. Sand is tested for permeability, moisture, compression, green strength (before baking), and dry strength (after baking).

The ingredients are mixed in the foundry in large quantities. Most foundries have large, electrically operated mixing machines called sand mullers or sand mills. Sometimes the loading of the machine—at least in part—is a laboring job.

Sand-conveyor systems, often enclosed to prevent dust, convey sand to the various parts of the core and mold departments, and the operator of the sand-conveyor system sees that hoppers are filled when necessary. The sand-conveyor operator often sits on a catwalk above the work section of the molding department.

In some foundries the sand is not prepared or tested so carefully as here outlined. The sand may be mixed with other materials right on the floor of the coremaking or molding department, either by hand for

small quantities or by sand-cutting machine for larger quantities. Sometimes machines are used for the drying of sand. When used molds have been broken up, the used sand is reclaimed. Used cement also is reclaimed, being ground up in enclosed machines.

Work for Women.—In a number of foundries women were operating the sand mills and the sand-conveyor system and in some cases they were doing the laboring connected with supplying the sand-mill machines.

Women were observed, in various foundries, operating the reclaim machines, the sand-drier system, shoveling and mixing sand, and doing other laboring jobs connected with the sand system.

Women were employed as sand testers (sometimes in the laboratory) in many foundries and were said to be especially good at this work.

Pouring Molten Metal Into the Molds.

Molten metal is brought from the furnace section of the foundry to the mold section and is poured into the molds. Pouring may be done off and on throughout the day or only at a stated and limited time. Molders may act also as pourers, but this practice is unusual. Pouring for small molds may be done from long-handled ladles carried by hand (this is heavy work), or from small ladles guided along a monorail support. Pouring for large molds is done from ladles carried by overhead crane. The metal pourer, with his helpers, not only guides the ladle into place over the gate of the mold but controls the stopper of the ladle when the ladle is bottom-poured, or the tipping of the ladle when the ladle is lip-poured. The pourer must not miss the gate of the mold, he must not allow the molten metal to overflow from the gate, he must know how much and how fast to pour. Skill and responsibility are involved in pouring. Not only is this a hot job but it has its hazards.

No women were used at metal pouring in any of the foundries surveyed.

Shaking Off the Molds, Knocking Out the Cores.

Small molds are broken up very soon after the metal is poured, and the casting is picked out of the broken-up sand. Cores inside the casting also are broken up and shaken out and the loose wire gaggers are removed. With small molds this is sometimes accomplished simply by throwing the warm molds into a pile on the floor, helpers fishing out the small, hot castings from the pile of sand with hooked picks. Frequently larger molds are battered by weights from a crane, or are placed on a grating where the sand is shaken loose by an electrically operated shake-out machine. Even with the shake-out machine much hand labor and lifting is required of laborers; the work is dirty; the castings are hot; and the machine is noisy and causes much vibration for the operator.

Cement molds on large castings are not easy to remove. They are first battered by weights carried by cranes, to break off some of the cement. Later, after the castings have been allowed to cool slowly for some time, the remainder of the adhering cement, with its many heavy-rod reinforcements, must be loosened by long, heavy, pneumatic chipping hammers. The cement cores with their reinforcing rods and bracings also must be removed, by long chipping hammers, from the inside of the castings. This is strenuous, dusty, noisy, and very difficult work.

Work for Women.—Only in one foundry were women doing any work connected with the removing of castings from the molds. There women were operating the shake-out machine, and the work was thought to be not entirely suitable because of the vibration.

The Furnace or Melt Department.

Metal for castings may be prepared and melted in electric furnaces, open-hearth furnaces, cupolas, reverberatory or air furnaces, tilting furnaces, and crucible furnaces, depending on the requirements of the foundry. The type of furnace used makes practically no difference in the work, so far as the possible utilization of women is concerned. A small crew of melters and melter helpers, or furnace tenders and furnace chargers, work at the furnace or furnaces. The work involves much skill and responsibility and sometimes strength; there is, in spells, much heat; and there are all the hazards of work with hot metal. When the furnace is tapped, the melters and their helpers take charge of the pouring from the furnace.

Furnaces and ladles have to be patched or completely relined at intervals with heat-resistant material. Ladle liners and their helpers tear out old linings, patch linings, lay bricks for new linings, and dry out the ladles or keep ladles hot with oil jets and air set on fire.

Work for Women.—In the foundries surveyed women were used in the melt department of only one foundry, acting as helpers for the furnace charger and giving most of their time to the weighing of scrap. One woman was operating a crane to supply stock to the melt department but she was not transporting molten metal.

The Metallurgical Laboratory.

Not only must a sample of the molten metal be tested by the melter at the furnace at intervals throughout the melting, but samples of every heat are sent to the metallurgical laboratory for physical and chemical testing. The work in the laboratory has been broken down so that much of the routine testing can be done by relatively unskilled workers under the direction of a skilled chemist or metallurgist. Various machines are used for making physical tests.

Work for Women.—In the foundries visited by the Women's Bureau, women were operating machines for physical tests, making routine chemical tests, making spectroscopic tests, acting as laboratory aides, charging castings to testing furnaces, and repairing instruments for the laboratory. There were a few women who were skilled chemists.

The Cleaning and Finishing Department.

Castings, when removed from the mold, are "in the rough." Sand that adheres to the surface of the casting must be removed by sandblasting, fins must be ground off, gates and risers must be cut or burned off, rough surfaces must be smoothed by grinding, and defects must be patched by welding.

Sandblasting.

Sandblasting of large castings is done in specially constructed, enclosed sandblast rooms, where the sandblaster operates a pneumatic hose to shoot steel shot, steel grit, or, less commonly today, sand particles at the rough castings. The worker has to exercise judgment in the amount of sandblasting that is done, and much lifting and

turning of castings is sometimes necessary. The occupation is a rough one and a hazardous one, with a danger of silicosis, though the worker today wears heavy protective clothing, a helmet over his head, and is supplied with compressed air for breathing.

Smaller castings are cleaned in an enclosed sandblast machine, in many cases a rotary machine. The worker feeds castings to the machine and removes them, often giving them a quick visual inspection at the time. Though these machines are enclosed and have exhaust connections, some of them permit sand dust to escape into the foundry when joints of the machine are not completely tight.

Work for Women.—In several of the foundries visited, women were doing this feeding and taking-off of work at the rotary sandblast machines when the parts to be lifted were not too heavy for a woman to handle.

Small castings may also be cleaned in revolving tumblers, and women were doing some of this work.

Chipping.

Cleaning of larger castings involves chipping with pneumatic chipping hammers or chisels, large and small. On very large castings, especially on the castings made in cement molds, there is much of this strenuous work. Chipping hammers, if large, cannot be managed by women. Though women can handle smaller chipping hammers, the work is generally considered unsuitable for women because of the vibration. Very small pneumatic chisels for bench work may not be harmful for women to use. Since chipping hammers frequently are used to clean large castings, weight-lifting may be necessary, unless the job has been so broken down that all turning of castings is done by laborers or hoists. Chipping hammers are very noisy. There is the constant danger of eye injuries from flying chips of metal. All workers in the cleaning department of a foundry should wear goggles.

Work for Women.—Women were working as chippers in the foundries visited. Those who operated the small pneumatic chisel grinders or bench chisels did not object to the work, but frequently some woman operator of the larger chipping tools would give up her job because she could not stand up under the work.

Grinding.

Grinding of castings, to give them a smoother finish, may be done with the large swing grinders; against stationary grinding wheels, large and small; or with portable grinding wheels or lightweight, portable pneumatic grinders of different shapes and sizes.

Work for Women.—The swing grinder consists of a large grinding wheel supported by a long arm and counterbalanced. The worker stands between two metal handlebars, which he manipulates as he pushes, pulls, and guides the wheel over the large casting. This work requires considerable strength. There is also great vibration, felt over the entire body. The work is not suitable for women. Women were operating swing grinders of smaller and larger size, in some of the foundries visited.

Stationary grinding or stand-grinding involves pressing and holding the casting against a revolving grinding wheel. If the castings are small this work can be done by women. Women were stand-

grinders, at both large and small grinding wheels, in several of the foundries surveyed.

The operation of portable grinding tools, if the tools or the parts handled are not too heavy, is entirely suitable for women, and women were doing this work in some of the foundries visited by the Women's Bureau. They were using the 3-inch to 5-inch portable grinding wheel and the small pneumatic "pencil grinders."

Burning.

Risers and gates usually are removed from the larger castings by burning, using the acetylene torch. The metal fumes from burning are a gastric irritant to some workers, though respirators can be worn. There is also the danger of small burns. The job, unless so broken down that weight-lifting is done by crane or laborers, often involves turning and lifting the heavy castings.

Work for Women.—A few women were employed in the foundries as burners. More women were merely burner helpers and did none of the burning or weight-lifting.

Welding.

Arc or acetylene welding is done to patch up defects in the casting and not to join parts. Where very large castings are involved the welder may have to work inside the casting as well as outside, and this is true also of burning. Welding may involve some lifting of heavy castings.

A few women were working as welders in the foundries.

Power-Operated Machines.

There are various machines, automatic in operation, in the cleaning department of the foundry. For instance, hydraulic straightening presses, large and small, are used to true up parts of castings. Feeding the machine may involve some lifting of heavy parts. Further, the operator cannot be unskilled, since judgment is required to know what should be done to the casting and where the pressure should be applied. In a job shop where the work is not repetitive "green" workers are not likely to be trained for this work.

Automatic machines (shears) to cut off sprues or gates may be used on small castings. Metal bandsaws or handsaws also may be used to saw off gates, and hand files may be used to remove burrs.

In some establishments, such as die-casting foundries (quite different from the usual foundry), there may be machine-tool work for finishing the castings, and many automatic machines, especially adapted for the cleaning and finishing of the castings, may be in operation.

In the foundries surveyed by the Women's Bureau some women were found doing the foregoing types of work.

Forging.

A few foundries do some forging. Women seen in one foundry were operating the drop hammer, under the direction of the blacksmith.

Heat-Treating or Annealing of Castings.

Many castings have to be heat-treated to relieve stresses or strains created during casting and cooling of the metal. Small castings may be fed by hand to a continuous belt that leads into an annealing fur-

nace, while larger castings may be stacked in the furnaces by hand or lifted in by crane, or may be placed on a car, electrically operated, and run into and out of furnaces on tracks. Tenders of the heat-treat furnaces must light and regulate burners, regulate flow of oil, air, and water, watch recording instruments for temperature, open and seal doors, time the heat-treat, and so forth. For short periods of time the worker is in contact with heat. Some castings have to be quenched in water, and some in oil, and sometimes this involves weight-lifting. The jobs in the annealing section may be broken down in various ways to utilize women workers.

Work for Women.—Several plants visited used women in the annealing section, as annealers, annealer helpers, gas operators, gas-furnace operators, and heat-treat-furnace operators. There were women who lighted burners, tended the controls of the furnaces, and read the dials; there were others who did only part of the work of operating the furnaces, some merely feeding parts to the furnaces, some tending doors, some acting as helpers to the male operators. All weight-lifting that might be too great for the women and all "quenching" of castings was done by male workers.

Inspecting and Testing.

Castings must be inspected and tested. Much of the work is visual inspection in the cleaning department, and in job shops where large castings are made some of the visual inspecting of large castings may require the exercise of considerable judgment and an understanding of foundry processes. There are also various tests of castings, such as the water test (a bench-work job) for small castings, magnaflux testing, the Rockwell hardness test, fluoroscopic tests, and X-ray tests.

Work for Women.—In foundries doing production work on small castings, many women were used at bench work for visual inspection, as "first inspectors," combining a quick hand-cleaning operation with visual inspection, as "floating inspectors," and as "final inspectors," sometimes combining the weighing and counting operations with the final inspection. In other foundries, some women were giving a visual inspection to larger castings, using a lamp or flashlight and marking defects in the casting. Women were also working at all the special tests mentioned above.

Painting.

Castings usually are painted, often spray painted, to protect them from rust before they leave the foundry. Women were doing some of this work in the foundries visited.

The Shipping Department.

Weighing, counting, packing, and checking of castings, in some cases done in the shipping department of the foundry, frequently are done by women if the castings are small. Women do some of this work where large castings are involved if jobs are broken down to prevent weight-lifting.

Occupations Common to All Departments.

The Operation of Lift Trucks and In-Plant Tractors.

Electric tractors or lift trucks cannot in all cases be operated by new workers, especially women, in a foundry. Floors are likely to present

difficulties, with broken sections, different levels, crowded aisles, dirt, and clutter. Not only is there much jouncing in a tractor, which may bother women, but it may be difficult for an operator to manipulate the vehicle safely if he is unfamiliar with the foundry. Women have proved excellent workers at driving lift trucks and tractors in many of the war industries, but the suitability of their work in this connection in foundries—though a few women were found doing this work—will depend largely on the environment of the particular foundry.

The Operation of Cranes.

Electrically operated overhead and side-wall cranes and magnet cranes are utilized for lifting in modern foundries. In crowded foundries where cranes pass directly over the heads of workers, the crane operator has tremendous responsibility not only for the valuable castings, the molds and the cores, but for the life of his fellow workers. Crane operators who carry ladles of hot metal must be highly skilled and dependable.

Work for Women.—In the foundries surveyed, no women were operating cranes that conveyed molten metal or were used to break up cement molds, but women were operating cranes in almost every other section of the foundry. Women make excellent crane operators, but it is easier and safer to use new workers, whether women or men, as crane operators where there is more space and where the work can be arranged in such an orderly fashion that cranes, with their heavy and dangerous loads, can pass over free aisles for much of their conveying rather than over the heads of helpless workers.

General Labor.

Much continuous and hard labor is necessary to the operation of a foundry, but only two of the foundries visited seemed negligent about guarding women against lifting more than a woman should handle. Many women were used in the separate departments or throughout the plant for either the light-labor jobs, such as the never-ending sweeping and clean-up work (some of the women at the constant "dry sweeping" in the dusty foundries wore respirators), the carrying of core plates, and the wheeling of core racks into the ovens, or for the heavier-labor jobs that involve such tasks as shoveling, filling, pushing, and dumping wheelbarrows, stacking bricks, and unloading boxcars and hopper cars. The unloading of hopper cars, with their slanting bottoms, is not always pleasant work for the laborer, who must maintain his footing inside the car while he shovels out material that sticks to the sides of the car.

DIE-CASTING FOUNDRY WORK

Die-casting foundry work, where the metal poured is often aluminum or zinc, is not typical of the usual foundry. In the die-casting process the metal is cast directly by machines in permanent steel dies rather than in sand molds. The dies are set in large casting machines. In oversimplifying the description of a die-casting foundry it can be said that the operator of the machine sets the die in the machine, pours in a small quantity of molten metal for each casting operation, pulls the long lever that activates the hydraulically operated machine, and

removes the completed casting. In such a plant the foundry proper consists, therefore, largely of rows of die-casting machines together with a furnace section or melt department. Castings made by this process—a process that is limited to certain types of work and cannot be adopted by most foundries—are relatively clean, and when they leave the machine are already made to tolerances that approximate fairly closely the size and shape required in the finished product. Therefore, much of the work done in inspection and in the cleaning and finishing departments is bench or machine work that more nearly corresponds to what is done in companies specializing in the final machining of castings rather than in the making and selling of the rough casting. At time of visit the one die-casting foundry surveyed was using no women in the melt or die-casting-machine departments and there were no jobs in those departments that were considered entirely suitable for women. Though the die-casting machine is power-operated, the operator must have considerable strength for the continuous work and he must know also how to handle emergencies when anything goes wrong with the machine. The machines in this one plant were crowded rather closely together and in some sections of the area there was heat, since the furnaces were nearby and small ladles of molten metal were being transferred throughout the shop at frequent intervals. More than 28 percent of the workers were women, but they were engaged almost entirely in the cleaning operations—which in this plant involved hand work or the use of automatic machines for the most part—and in inspection, testing, weighing, and packing.

Women's Distribution by Department in 6 of the Foundries Surveyed by Women's Bureau

Department	Foundry—					
	A	B	C	D	E	F
Women employed in foundry proper:						
Number	30	79	54	586	214	341
Percent	100.0	100.0	100.0	100.0	100.0	100.0
	Percent distribution of women by department					
Drafting (tracers, blueprint workers, etc.)	----	----	3.7	----	----	----
Pattern shop	----	----	7.4	0.3	----	----
Coremaking	50.0	10.1	16.7	3.6	35.0	14.7
Molding and sand system	16.7	16.5	5.5	17.9	3.7	21.1
Cleaning and inspecting	20.0	38.0	25.9	53.1	60.7	19.3
Melting furnace	----	----	----	----	----	1.2
Laboratory	----	1.3	13.0	2.6	----	1.8
Lift-truck operating	----	----	----	4.1	----	----
Crane operating	3.3	21.5	----	1.0	.5	11.7
General labor	10.0	12.7	27.8	17.4	----	30.2

List of Occupations Filled by Women in 13 Foundries

(Some of the occupations overlap, since jobs are broken down differently in the various shops)

Drafting or Engineering Department

Blueprint maker.
Blueprinter and blueprint filer.
Draftsman (skilled).
Tracer.

Pattern Shop

Laborer, pattern shop.
Metal-form (metal pattern) helper.
Metal-form labor.
Pattern sander and painter.
Pattern storage (receive, store, issue patterns).
Pattern-storage labor (shellac, sand, paint, letter, glue fillets).
Patternmaker checker (pattern checker, learner).

Coremaking Department

Bench coremaker.
Core assembler, core joiner, or core jointer.
Core cleaner.
Core finisher.
Core gager.
Core glazer.
Core inspector.
Core painter.
Core paster.
Core-plate handler.
Core-shop labor.
Core stacker.
Core-storage worker.
Coremaker (maker of large cores).
Coremaker (maker of small cores).
Coremaker helper.
Gate coremaker.
Laborer.
Lift-truck operator, core room.
Oven tender.
Transfer-table operator.
Turnover-machine operator (coremaking machine).

Molding Department

Assembler of arbors.
Bench moldmaker.
Chill greaser.
Crane operator.
Lift-truck operator.
Mold checker.
Mold drier.
Mold finisher.
Mold-machine helper.
Molder helper.
Sand-slinger operator.
Shake-out-machine operator.

Sand System

Batchman.
Dumper.
Laboratory helper (sand tester who also acted as pyrometer helper for melt department).
Laborer.
Reclaim labor.
Reclaim operator.
Sand-buggy operator.
Sand-conveyor operator. Conveyor girl.
Sand-drier operator.
Sand-mill laborer.
Sand-mill operator.
Sand mixer.
Sand tester.

Melt or Furnace Department

Charger helper.
Crane operator—stocker.
Weighman.

Heat-Treat Department

Annealer helper.
Annealer operator.
Annealer-overman.
Annealing-furnace helper.
Furnace checker.
Furnace-door-tender operator.
Gas-furnace operator.
Gas operator.
Heat-treat-furnace operator.

Metallurgical Laboratory

Analytical chemist.
Assistant chemist.
Casting charger.
Chemical laboratory laborer.
Instrument repair.
Laboratory aide.
Laboratory helper, physical testing.
Machine operator.
Physical tester.
Routine chemist.
Spectroscopist.

Cleaning and Finishing Department

Arc welder.
Automatic-machine feeder.
Band-saw operator.
Burner.
Burner helper.
Casting painter.
Casting spray-painter.
Chipper.
Chisel grinder.
Crane operator.
Dark-room attendant.
Dimensional checker.
Drill-press operator.
Final inspector.
First inspector.
Floating inspector.
Fluoroscope operator.
Forming-press operator.
Foundry Gantry-crane operator.
Grinder.
Inspector.
Kick-press operator.
Laborer.
Lathe operator.
Light hand filer.
Magnaflux-machine operator.
Packer, light.
Portable-grinder operator.
Punch-press operator.
Rockwell hardness-testing machine operator.
Rotary-sandblast-machine operator.
Sandblast helper (helper to sandblast operator).
Stand-grinder operator.
Straightening-press operator.
Supervisor of inspectors.
Supervisor of weighers.
Swing-grinder operator.
Tapping-machine operator.
Tractor operator.
Tumbler operator.
Water tester.
Weigher.
X-ray developer.
X-ray operator.

Forge

Drop-hammer operator.

General (for several departments of foundry)

Clean-up labor.
Crane operator.
Crane operator learner.
Elevator (freight) operator.
Hooker (crane follower).
Labor.
Lift-truck operator.
Tractor operator.

Maintenance

Construction labor.
Guards.
Storeroom labor.

Maintenance—Machine Shop

Crane operator.
Heat-treat of chisels.
Laborer.
Lift-truck operator.
Machine operator (drill press, radial drill press, milling machine, grinder, lathe, gear cutter, and power saw).
Machinist helper.
Millwright helper.
Oiler.
Tool cleaner.
Tool grinder.
Toolroom attendant.
Welder.

Maintenance—Electrical Department

Armature winder.
Crane operator.
Electrician.
Electrician helper.
Oiler.

MAINTENANCE—SERVICE FACILITIES

Bus girl.
Canteen clerk.
Cashier.
Cook.
Counter girl.
Dishwasher.
Janitress.
Locker-room attendant.
Matron.
Nurse.
Porter.

PLANT—CLERICAL

Checker.
Expediter.
Factory clerk.
Foundry-schedule-room clerk.
Production clerk.
Schedule clerk.
Stock-record clerk.
Storeroom clerk.
Timekeeper.
Valve chaser.

GENERAL OFFICE

Bookkeeper.
Clerk.
Interviewer.
Machine operator.
Messenger.
Receptionist.
Secretary.
Stenographer.
Superintendent of women (women's counselor).
Switchboard operator.
Typist.

THE FOUNDRY ENVIRONMENT

Though not all foundries have modern equipment, all the 13 surveyed in this study had, to a greater or less extent, modern conveying equipment and modern labor-saving machinery. A few of the foundries also had new, large buildings with the best of dust-arresting, ventilating, and vacuum-cleaning systems and much space for the arrangement of their work. Some of the foundries, with their war orders, were crowding too much work into a space that originally was planned for a normally smaller production, and some had attempted to add modern equipment to a building that was too small. Crowding seems to be one of the outstanding problems in the foundry environment. Older foundries are likely to be too small in area because, in the days before modern conveying equipment was available, it was necessary to have all the work processes close together, especially to prevent cooling of the molten metal before it was poured. A few of the foundries visited were especially interesting in this connection because there were both new foundries and old foundries in the same plant.

Noise.

There is excessive noise in most busy foundries. This is especially true of the cleaning and finishing department, with its pneumatic chipping, its sandblasting, and its various methods of grinding. Electric furnaces—if such are used—are objectionably noisy. The molding machines, the pneumatic rammers, and the shake-out machine, which breaks up the molds and cores from the newly made castings, cause an intermittent racket in the molding department.

Floor Hazards.

As a rule, though there are great contrasts among foundries in this respect, walking about in a foundry has its hazards. Floors in some cases are uneven and broken; there is great clutter everywhere, no matter how constant the cleaning; sand accumulates on the floor of

the molding department; and castings of all shapes and sizes, in various stages of the cleaning process, are scattered about the floor of the cleaning section. Other castings, partially removed from cement molds if such are used, may lie about in the molding or pouring section, with projecting and warped reinforcing rods sticking dangerously from the broken cement. In crowded foundries even the aisles are not always kept open.

Dust and Fumes.

The air of a foundry is heavy with sand dust, especially if the foundry is making very large castings or is crowded into an old building of inadequate size. Foundries built in recent years usually have modern dust-removing, ventilating, and vacuum-cleaning systems, and many of the newer buildings are spacious, with exceptionally high ceilings. However, even these improvements cannot keep a foundry entirely free of dust while work is going on, because of the nature of the work. Though today much of the sand may be carried in a covered conveyor and rotary sandblast machines are supposed to be airtight, busy foundries sometimes allow equipment to get out of order and more sand escapes than should be the case. The sand used in foundries contains silica. There is also some metallic dust in the air, especially in the cleaning department. Hence there is, for all foundry workers, some likelihood of eventually contracting siderosis from the metallic dust or silicosis from the sand dust. At pouring time the air of the foundry is oppressively heavy with the smoky smell that rises when molten metal strikes the sand in the mold. Metallic fumes are a gastric irritant to some of the workers who are near the burning operations in the cleaning department.

Eye Hazards.

Where electric arc welding is being done in the cleaning section, not all foundries are careful about shielding the work so that nearby workers may be protected from the arc. Flying chips of metal are a special hazard in the cleaning department, and workers do not always wear goggles when they should. Radiant heat is injurious to the eyes of workers whose occupations keep them in contact with molten metal.

Hazards of Molten Metal.

At the furnaces there are all the hazards, together with the heat, that are connected with the preparation and melting of metal. In the pouring section there is the danger of molten metal slopping over from the hand ladles as the workers rush back and forth at their work. There are the hazards of molds exploding when the metal is poured, or of the spatter or "running over" of molten metal if the pouring from the large ladles is not carefully done. Cables to which are attached the large ladles of molten metal, carried overhead by crane—sometimes over the heads of many workers on the floor—have been known to break.

Overhead Hazards.

Overhead cranes with their heavy loads pass constantly back and forth throughout all sections of the shop—cranes carrying heavy steel flasks containing molds, cranes carrying huge castings, cranes carrying molten metal, magnet cranes carrying scrap. In foundries that are new and large, where the work can be arranged in more orderly

fashion than in old plants, it is often possible for cranes to transport much of their heavy burden over free aisles rather than directly over the heads of busy workers.

Work in foundries may be dirty, heavy, and dangerous, but it is interesting. In spite of the notable exceptions in certain occupations, workers in the heavy metal-working industries often appear less harassed and worn than workers in lighter but speeded-up work at line production. Foundry employees often have breaks in their labor, an opportunity to pause, look around, and talk with one another, and a variety of things to do in their work that relieves monotony. If the environment of the foundry is not too bad, if there is a good safety program, if the worker is assigned to a job that is suitable to limited strength and endurance, there is no reason why women, as new "green" workers, cannot fill a limited number of the less skilled jobs in the foundry, and no reason why some women—since women vary in their preferences as men do—might not find these jobs more interesting than the usual "woman's job" in certain factories.

WAGES, HOURS, AND WORKING CONDITIONS

Wages.

Minimum starting rates for women production or plant workers in foundries were concentrated at 70 to 71½ cents. In 9 of the 13 plants, with three-fourths of the women workers, the beginning minimum for women fell in this small group. In all but 2 of these, men's beginning minimum was the same as women's; in the 2 exceptions it was several cents higher than women's. In the large foundry that had more women than any other 1 plant the beginning rate was 78 cents for both sexes. At the other extreme were 3 small plants, with few women, that started women at only 45, 55½, and 60½ cents, respectively. Here the corresponding figures for men were 50 , 65½, and 71½ cents. Thus 8 of the foundries paid men and women equal starting rates, while in 5 there was a sex differential of from 5 to 11 cents an hour in favor of the men.

In about half of the foundries there was a provision for an automatic wage increase over the starting or minimum rate—a specific amount after a definite time interval. Sometimes this was accomplished in one step, sometimes in two steps. The amount of the increase varied from a total of 5 cents an hour to a total of 10 cents an hour, in each case after 3 months.

In 11 of the plants surveyed there were, for all workers except those in the unskilled jobs or in the "labor pool," definite job rates, sometimes with a range of rates on each job allowing for increases by merit and seniority. In at least 11 plants some of the women had been advanced to specific jobs and were receiving job rates rather than the unclassified labor rate. In one of the foundries paying equal starting rates, women placed on jobs with job rates were kept in the learner classification for 30 days longer than men. In the foundries that paid women a lower starting rate than men it was also true that when the women had been placed on a specific job carrying a job rate (above the starting rate), frequently such rate was lower for women than for men on the same job. It was claimed by management that some of the jobs had been broken down in order that women might be able to

do them, and that in the instances where rates were different for men and women, the women were not doing the whole job as it had been done by men.

The wage rate was figured on an hourly basis in all the plants. For a number of the jobs in each of 8 plants there were either additional incentive rates or departmental production bonuses divided among the workers.

The prevailing rate paid to women production workers at time of study ranged from 65 cents to $1 an hour.[1] However, since some firms included the incentive earnings in this estimate and some did not, comparisons cannot be made. In at least 4 plants the prevailing rate was still the starting rate. In 8 plants the apparent increase in the prevailing rate as compared to the starting rate ranged from 3½ cents an hour to 22 cents an hour. It is likely that incentive earnings were included in the estimates for the higher prevailing rates, but this cannot be determined from the data available.

In 9 plants a higher rate was paid to workers on the second and third shifts, in some cases slightly greater on the third than on the second shift. This shift differential varied from 2½ to 6½ cents an hour in one system of figuring, and from 5 percent to 10 percent over the worker's base rate in another system. A third method of providing for a shift differential was to pay the workers on the second and third shifts for a full 8-hour day though they worked but 7¼ hours.

Hours.

It is difficult to summarize weekly hours of work with accuracy, since sometimes there are departmental variations within the plant. Also, hours within a department may fluctuate, due to shortage of workers or to rush orders or a cut in orders. Very occasionally second and third shifts are somewhat shorter than the day shift, to provide time for lunch and a reward for the workers on the less desirable shifts. In States whose laws require that women be allowed a definite lunch period, women in some cases (see p. 20) are paid for a shorter day than the men, though the over-all hours of work may be the same.

In the foundries visited by the Women's Bureau the most usual pattern (day shift) was a 48-hour week of six 8-hour days. In 1 plant the men were working only a 5-day, 40-hour week, and in 4 plants the men were working more than 48 hours, some working (by department) 50, some 55 or 56, some 60, and a few 72 hours a week. Women's hours, considering the time taken off for the lunch period, fell into the following groups: 40 hours a week, 5 days (1 plant); 45 hours, 5½ or 6 days (2 plants); 47⅙ hours, 5½ days (1 plant); 48 hours, 6 days (7 plants); 45 or 48 hours, 6 days (1 plant); and 50 hours, 5 or 5½ days (1 plant). Thus the most usual hours were 48, on six 8-hour days.

All but 3 plants were working 3 shifts, and 2 of the exceptions were working 2 shifts. In 5 of the plants women worked on only 1 shift; in other cases they worked on all 3. There was an arrangement for weekly rotation of shifts in only 4 foundries. In the others, with occasional departmental exceptions not affecting the women, shifts remained fixed. One company stated that it made special effort to

[1] Ascertained not from an examination of pay rolls but from an estimate made by management, and hence only approximate.

help working housewives and mothers by arranging suitable hourly shifts for individual women, but another reported that most of the women were obliged to work on the second or third shifts because the union protected the seniority rights of the regular male workers and most of the men preferred the first shift.

Though men were required occasionally to work more than the scheduled hours—sometimes a 7-day week or sometimes through more than one shift in continuous operations—it was reported that at date of survey there was little overtime for men or women. Some plants did not permit women to work beyond the number of hours scheduled, and in no instance was a woman required to work more than 50 hours a week.

Because there is very little that approximates line production in the metal-working industry, formal arrangements for rest periods are not common, nor perhaps always necessary. However, the environment of a foundry is not pleasant and the work is often exhausting, and consequently a formal rest period—especially to break the long morning—is considered by some foundries as contributing to better work. A formal rest period of from 5 to 15 minutes in the middle of both morning and afternoon was allowed for men in 2 plants and for women in 3 plants. In 3 other foundries there was a formal rest period of 10 minutes for both men and women in the morning. In several foundries with no formal rest periods, provision nevertheless was made for definite intervals of time off the job for metal workers, crane operators, and a few others, depending on the nature of the work.

In plants having 3 shifts of an 8-hour turn it is not possible to permit a lunch period without extending hours so that shifts overlap, and an overlapping of shifts is almost never feasible. Therefore, even on jobs that do not require it, the custom is for workers to eat on the job or at their work. At this time they usually are allowed a little less than 30 minutes' leisure, more frequently 15 minutes, on company time. In foundries, as in steel mills, workers often have "spells" of waiting on different processes, or breaks in their work, and so, if they bring their lunches or buy refreshments at the canteen or from the snack truck that goes through the plant, they have plenty of time for eating and frequently are found lunching at odd hours of the day. However, this arrangement does not permit a worker to go to a cafeteria for a hot lunch and proper relaxation.

Many State laws provide that a female employee must have a definite lunch period of at least a half hour. Because of this there were 2 foundries among those visited by the Women's Bureau that paid women for a 7½-hour turn though the men, who probably had as much time in which to eat, were paid for an 8-hour turn. The men's lunch period was not indicated definitely and they may not have been so free as the women to leave the job for a full half hour.

In 2 foundries with the 3-shift arrangement, both men and women on the first shift had a definite half-hour lunch period, not on company time. This was due to the fact that second- and third-shift workers, whose half-hour lunch period was on company time, worked less than 8 hours (though paid for 8 as an incentive to work on the less-desirable shifts). In 2 of the 3-shift foundries women were employed in departments that worked only on the day shift, since not all departments in 3-shift plants worked the 3 shifts, and so it was possible for the women, and some of the men, to have a 1-hour

lunch period. In 3 of the 3-shift plants, and in some departments of a fourth, women, like men, had a lunch period (less than a half hour) on company time. In the 3 foundries that, with some departmental exceptions, operated only 1 or 2 shifts, the women and most of the men had a 30-minute, 55-minute, or 1¼-hour lunch period.

Food Services and Facilities.

Four of the 13 foundries surveyed maintained 1 or more cafeterias that served hot meals and food of considerable variety, and 1 other plant was adequately cared for by a restaurant across the street from and controlled by the plant. Another 2 of the foundries had commissaries, without seats or tables, where the workers could buy sandwiches, hot and cold drinks and desserts. Another had a similar commissary where hot plate-lunches could be bought. In the 5 foundries where there was neither cafeteria nor commissary, milk and cold drinks were available in 2, and in another sandwiches, coffee, and other light refreshments could be bought at a concessioner's lunch wagons that passed through the plant.

Six of the foundries that had no cafeteria where workers could sit down to eat provided at least tables and chairs for this purpose either in the women's rest rooms or in special "lunch-eating" rooms, and in 1 of these rest rooms coffee and tea were made ready for the women by the matrons at lunch time.

In 2 of the foundries there was a special food service for those who ate on the job and could not get to the cafeterias and for those who wanted refreshment during the day. "Snack trucks" with light lunches went through the plant not only at noon but also in the middle of the morning and the afternoon. This kind of service is appreciated in large plants where all workers are not equally close to the cafeterias and cannot get to them conveniently in the short lunch periods. Two of the foundries surveyed attempted to meet this problem by having cafeterias in more than one building of the plant.

It is interesting to note that only 1 foundry was completely indifferent to supplying any place to eat or any food for the workers. In the other foundries, though great differences in the food services were apparent, there seemed to be a growing interest in providing adequate food and a place in which to eat.

Medical Facilities.

Because foundry work is heavy and hazardous, all the foundries surveyed required a preemployment physical examination, 9 of them including X-ray of the lungs for men and 8 including X-ray of the lungs for women. Only 3 plants definitely required a Wassermann and 2 required a blood test. Considerable emphasis was placed on examination for hernia, blood pressure, and heart condition. One plant specified that it did not require so rigid an examination for women as for men, and one that its examination was more rigid for women than for men. Because of the tight labor market in this war period, probably no company has been so careful in the selection of workers, on the basis of a physical examination, as it was in the past.

All but 1 of the foundries had some kind of hospital or dispensary at the plant, but there were great differences in the facilities provided; some were units of several rooms, with small bed wards and all kinds of equipment for examination and treatment, and others were simple

dispensaries, a few being crowded, untidy, and ill-equipped. All these 12 services had registered nurses on duty, usually throughout all shifts. Occasionally a medical student, a practical nurse, or a first-aid man served in place of the registered nurse on the third or smallest shift. In the case of all dispensaries there was at least 1 doctor on call at all times, and in 7 of them physicians were on duty at regular hours for part of the day.

Reexaminations of workers in the more hazardous occupations were, with few exceptions, not required. A few companies required that sandblasters be reexamined at regular intervals.

The one foundry that had no dispensary took care of minor injuries in the personnel department and had neither nurse nor doctor on duty. The personnel workers and some other employees throughout the plant were trained in first-aid work. This plant sent workers for examination, and treatment when required, to an industrial clinic several miles from the plant.

The plants surveyed reported that the new women workers, though "green" and not used to the environment of the foundry, proved to be safe and careful workers on the whole. Of course, the women workers were not employed on the more hazardous jobs, but like all workers in a foundry they were subject to the dangers and to the unfavorable environment of the plant. Slight burns and cuts, an occasional toe fracture or small foot injury from falling objects, a smashed finger, foreign objects in the eyes, were the most frequent of the accidents that had been reported for women. The one serious accident reported was the falling of a woman from a crane while she was learning to operate it. A few women operating lift trucks had been injured when their trucks backed into objects in the crowded foundries, and several women operating lift trucks complained of the constant jouncing caused by operating trucks on the uneven floors.

Some women seemed to be doing work that was too heavy for women and some were subject to harmful vibration. This was especially true of the women operating swing grinders and chipping hammers. One plant reported that the turn-over rate among women chippers was very high. The harmful effect, if any, of these occupations that are considered unsuitable for women cannot be determined at this early date. Constant standing; heat, on some of the jobs; the danger from objects falling from overhead cranes; the dust-laden air; the fumes, the dirt, and the noise were objected to by some of the women.

Work-Clothing Requirements and Practices.

There is not much danger of women insisting on wearing impractical or glamorous clothing in a foundry, and the observance of the simple factory rules in regard to clothing seemed to be better in foundries than in some other plants. Some of the foundries reported that they secured the willing cooperation of the women by making the rules advisory rather than mandatory, and one company, which was very strict in enforcing its rules, allowed the women to take part in the making of the rules when first they were drawn up.

In only two of the plants were there no requirements, mandatory or advisory, about clothing. In one of these plants the women sometimes wore house dresses rather than slacks and some of the women wore open-toed shoes. In all the other foundries women wore serviceable coveralls or slacks or men's overalls, and though, unfortunately, few

wore safety shoes, most of them wore heavy and sensible shoes. The majority of the women kept their hair covered to protect it from the dust, usually wearing bandannas.

Women frequently wore canvas gloves at their jobs, and where the job required it some wore protective equipment, such as respirators and goggles. Compliance with plant rules in regard to the wearing of goggles, where required by the job as is true of so much of the work in a foundry, was complete in some plants and half-hearted in others. Some companies required that all workers wear goggles throughout the whole foundry. Special protective clothing was required for the men working around the furnaces and at the pouring.

Six of the plants sold safety shoes and five sold slack suits, coveralls, or overalls, at the plant. Two companies supplied the women with their first uniform free of charge.

Toilet Facilities for Women.

Toilet facilities for women were adequate in all the foundries. There were great differences in rest rooms insofar as appearance and an atmosphere of cheer were concerned. Some of the toilet-rest-room units were purely functional and had no equipment that might encourage resting. In other plants management had made an effort to supply comforts and to create a pleasant environment for the women's leisure time. There was special reason for the latter arrangement in plants where the lunch period was sufficiently long for the women to enjoy the services provided.

Washing facilities were adequate and kept in good condition in practically all cases. Paper towels and soap generally were supplied, and where there were no dispensers of women's sanitary supplies these usually could be bought from the matron, stationed in the toilet rooms of some foundries. Ten of the foundries had provided showers and 10 had provided full-size individual lockers. Two companies supplied small purse lockers and clothing was hung below them on hangers. One plant, without space or equipment for lockers, met the problem by having a checking system in charge of the matron in the toilet room.

Many of the toilet-rest-room units comprised more than one large room, and frequently the cot or cots were in a separate room. Nine of the foundries supplied at least one cot, some of them several cots. A number had couches also, and fairly comfortable chairs for lounging. Nine of them provided extra space, in some cases large, in some small, with tables and chairs, for eating lunches in the rest rooms. In two cases there was an electric stove where tea and coffee, soup, and so forth could be prepared or heated.

Many of the larger plants had, in addition to the main toilet-rest-room unit, separate toilets and washing facilities in various sections of the shop.

Drinking facilities usually were adequate and sanitary throughout the plant.

Absenteeism and Turn-over.

The method of keeping absence and turn-over statistics differed so among the plants as to make comparison of findings hardly practicable. While four plants found women's absentee rates noticeably higher than men's, four others claimed that women's rates were lower than men's, and in still four others women's and men's rates seemed to be very nearly alike.

In two companies that had machine-tool plants and that kept absence statistics broken down by foundry, machine-tool plant, and office, the absence rate both for men and for women was much higher in the foundry than in other parts of the plant. The following are some of the causes of absenteeism mentioned by management: Sickness, tension and fag from long hours of work, necessity to care for personal and family problems, the nature of the occupation and the unpleasant environment of the foundry, and the poorer quality of some of the workers now employed. Lack of adjustment to the work, among new workers, together with the fact that the natural process of selection has not had time to cull out from among them the ill-adapted, means of course that the absent rate, as well as the turn-over rate, usually will be higher among newer employees than among the regular workers who have been employed by the plant for some time.

The companies surveyed had not, as a rule, any particular complaint about women's turn-over rate being too high; in some plants their rate seemed lower and in some plants higher than the men's rate. In speaking of turn-over in general, management seemed to feel that a high turn-over rate was to be expected in foundries, because the work is laborious and the environment unpleasant and hazardous. Foundry management's chief worry was the difficulty of securing workers while jobs in other industries were plentiful, this difficulty being aggravated by the fact that the wage level in foundries is not high, considering the nature of the work. Though management was inclined to believe that most men left their jobs because they were unstable or because they wished to "better themselves," it was likely to attribute other reasons to the women who quit, such as, "the work proved too heavy," "the glamor of war work had worn off in the grime of the foundry," or "there were personal and family problems." Wives of service men, leaving their jobs in foundries as in other industries to join their husbands, frequently have a high absence and turn-over rate. In one foundry bad personnel practices were thought to be the cause of a high turn-over among all employees.

A few foundries gave some attention to a good exit interview with all workers desirous of leaving the company, and some of the personnel directors thought this had real value in aiding management to detect weaknesses in the supervisory staff and to discover other problems, but few personnel workers thought the exit interview was of any noticeable value in cutting down turn-over.

Every community today has housing and transportation problems, but these problems were not so great in the areas where the 13 foundries were situated as to be considered important causes of absenteeism or turn-over. Only 4 of the foundries visited reported a housing shortage in the area, and none of them, with the possible exception of one that was trying to encourage a public housing project, was supplying any definite services to workers in finding housing. All but one of the companies tried to assist in simplifying the transportation problem, through the services of a special clerk, the personnel director, or a transportation committee, by taking care of gas and tire rationing and arranging for car-pooling schedules.

Though all the companies employed women with children and though home duties were admittedly a cause for some of the absenteeism and turn-over on the part of women, no company felt that there

was enough definite evidence of need of community nurseries and after-school care to work on this problem itself. Some personnel directors were becoming interested in the subject of child care, on the supposition that public child-care facilities might become necessary if the war were to continue much longer. For the present, however, most companies felt either that there were sufficient facilities available in the locality for those whose home problem could be met by such services, or that there was still a sufficient supply of women available to make it unnecessary to employ mothers who had no relatives at home to care for their small children. Since these foundries were using local rather than inmigrant women, there was likely to be a relative or neighborhood friend of the woman worker who would help in the care of the children. Sometimes the best worked-out plans went awry, however, and the woman had to return to her home. All the foundries agreed that there was not yet such a shortage of female workers that the company must employ women who were needed in their homes more than in the war industries.

PERSONNEL POLICIES IN HIRING, TRAINING, AND ADVISING WOMEN

Because it has been especially difficult to secure the male workers needed in foundries, and because foundry work not only does not attract many women but in general is heavy work, it is not surprising that the foundries visited by the Women's Bureau placed few restrictions on the hiring of workers. There were no intelligence or aptitude tests and, except for the skilled jobs that women were not prepared to fill, requirements in regard to education, previous experience, or vocational training were limited to laboratory and plant clerical workers, where a high-school education sometimes was required. Of course this relaxation of hiring rules is not uncommon in other industries today. The emphasis in selection, in the foundries, was on stability and good health and strength. The preemployment physical examination and, usually, a good first interview in the employment office were considered important. There was some attempt to fit the woman to the job. Agility and dexterity might be required on some jobs and physical strength and endurance on others.

For these reasons none of the foundries visited had any hard and fast rule in regard to the maximum age of the women employed. Four of the plants felt that the work was too strenuous for most women over 50. However, women of 50 were not uncommon and there were a few over 60 who were doing a good job at very hard work. Eighteen was the minimum age for women in 10 of the foundries, and 20, 20, and 21 were the minimums in the 3 others. Nine foundries preferred women over 30 (up to 35, 40, 45, and 50) and only 1 reported a preference for women under 30. The foundries that stated definitely that they preferred the mature woman worker gave as their reasons the fact that the older women had proved, by and large, to be more stable, less unsettled by the "urge for glamor," more conscientious and harder workers. A few stated that though the older woman might be better on the harder jobs, the younger woman was necessary on the jobs that required agility or constant standing. There seemed to be no general policy in regard to age. All the firms agreed that the problem was less a matter of age than one of personal fitness.

Some of the women employed were housewives who had had no experience at work outside the home or had been away from such work for a long time, others were women used to hard work in the home or on the farm (from the semirural areas), and still others had been working in nonessential industries. Many were wives of service men. Most of the women came from the local community or the surrounding territory and were recruited from among the relatives or friends of workers already employed by the company.

At time of visit, since standards had been lowered, only one of the foundries excluded women who had small children. However, in all the plants it was usual for the employment office to ask women applicants if they had provided adequate care for the children and to refuse to hire women who had been unable to make arrangements for such care. There is apparent a slight tendency in personnel and employment departments toward a relaxation of this rule, because of the difficulty in securing women workers. This was indicated by personnel workers who said that it did little good to worry about the woman's home obligations when she was applying for employment, because even under the best of arrangements emergencies could arise when she would have to give up her work in favor of her duties in the home.

Most of the foundries stated that the foundry was "no place for the pregnant woman." A few of the plants had a general pregnancy policy for all their female employees, permitting employment for a few months and a return to work after confinement provided the worker secured a doctor's certificate, but it is not clear, since women are new in the foundries and not all the women in the plants work in the foundry proper, that this policy would apply to women working in the foundry itself.

Eight of the foundries employed Negro as well as white women.

All training for new, "green" workers who are to be used during the war emergency was on-the-job training in the foundries visited. Some had used vocational-training schools and vestibule classes for training their first new workers, but all the emphasis at time of survey was on training on the job. To improve supervision, at least seven of the foundries had taken advantage of the Training-Within-Industry courses of the War Manpower Commission, but in only one of the foundries were there any women in these classes (a few women "key workers").

Very little was done by the foundries in the way of special orientation of new workers. Only one had an "induction class" (of 3 hours) in which plant policies were explained to new employees. In two plants the women's counselor talked at some length about plant rules, jobs, and so forth, to each woman worker as she was inducted. In two foundries this introduction to the plant was cared for in varying degrees of thoroughness by the industrial nurse, in one by the safety engineer, in one by the employment interviewer, and in one by the personnel director. However, all plants agreed that the foreman to whom the worker reported had most of the responsibility for orienting the woman to the job and to the plant.

Five of the foundries employed a woman to act in the capacity of women's counselor, though she was not called by that title.[2] Though the major emphasis in their work differed in the various

[2] One of the five women was lost recently to the "armed services."

plants, all five of these "counselors" were assigned the task of listening to and advising the women who had personal grievances or family problems that they wished to discuss in the office. While there is need of women counselors in every shop where women are employed for the first time, to assist the foremen and fellow workmen as well as new women workers in adjusting to unusual conditions, such women advisers can aggravate the problem if they lose themselves too completely in the role of sympathetic listener and unconsciously encourage the women to bring too many of their personal and family problems to the plant for consideration. Nevertheless, male personnel directors who have the time to do good personnel work often state that they do much to improve plant morale when they listen to and advise male workers who bring a variety of problems to them. It is advisable for women's counselors to confine their activities to subjects of plant concern and to refer workers with family or other problems to the proper social-service agencies in the community.

Four of the women's counselors employed had a sound understanding of the jobs in the foundry and the work women could do there, and though they could not interfere with the foremen in the matter of women's work they were, in at least two instances, supposed to advise on the suitability of various foundry jobs for women.

Two of the counselors, who gave a great deal of time to the first employment interview and to the orientation of the new women workers, were in the employment department and were able by this means to learn a good deal about the women and to become acquainted with them. This interviewing of applicants can be a handicap to a women's counselor if the employment office is swamped with applicants, but it is a good introduction to counseling work if there is time for other duties.

These five women's counselors sometimes had something to do with exit interviews or absentee visiting. Sometimes the counselors were in charge of the upkeep of the women's rest and toilet rooms, and frequently they were required to enforce rules regarding women's work clothing and behavior in general. In these five plants, as elsewhere, the counselor had a job that was rather indefinite in outline. Everywhere the job grows and takes form only as management, the foremen, and the workers become accustomed to making use of the women's counselor, and provided that she herself has the tact, the understanding, and the ability to "make something of the job."[3]

In plants that had no woman definitely assigned to the work of women's counselor there was in many cases a nurse in the dispensary, or a matron in charge of the toilet and rest rooms, or a woman interviewer in the employment department to whom it was customary to bring personal problems that could not be handled by the male personnel director.

EMPLOYEE ORGANIZATION AND AFFILIATION

In three of the foundries surveyed there was no labor organization, and in a fourth, which was in the process of being organized against the strenuous opposition of management, there was a company union

[3] See in Women's Bureau Special Bulletin 16, The Woman Counselor in War Industries—An Effective System, 1944.

that was relatively inactive. In eight foundries the CIO represe[nted] the workers, though in three of these a few craftsmen, such as the [ma]chinists and the patternmakers, were members of the AFL. In [one] foundry the AFL represented all the workers. Women were reporte[d] as interested members of the unions, but of course they were too new in the industry and too greatly in a minority to exert much influence. Two of the small craft unions did not admit women, but this was of no particular importance during the war emergency since there were no women with the skills necessary for admission to the craft. Two of the large plant locals showed some discrimination against women in the matter of seniority and wage rates.

SUMMARY

There are skilled or semiskilled jobs in a foundry—for example, burning and welding—that do not require many months of training; there are other jobs, such as molding, that require a long period of apprenticeship. In many foundries a skilled worker, to be valuable, must have a knowledge of casting problems in addition to the skills of his craft. He must be able to exercise a degree of independent judgment on each job assigned to him. This is, of course, true chiefly of job foundries where almost every casting order presents a special problem, or of smaller foundries where the individual workman may be required to have a knowledge of more than one type of work. A large proportion of the jobs in foundries, even of the skilled jobs, involve physical exertion—heavy lifting, hard labor. Some of the jobs are hazardous. The general environment of the foundry, affecting all workers, is not only relatively unpleasant but more or less dangerous, partly because of the accident hazard and partly because of the danger of silicosis, siderosis, and other ailments, due to the air being laden with silica and metallic dust.

It is apparent that women, even if they wished to remain in foundry work after the war, would have little or no opportunity to acquire the higher skills or advance up the job-progression ladder. The heavy nature of much of the work would in itself preclude that, even for women as capable as men of learning the skills. The foundry is likely to remain a man's world.

Where foundries are so organized that jobs can be broken down to prevent heavy lifting and where skills can be diluted, there are many jobs that women can fill during the war emergency. A few of the foundries visited by the Women's Bureau indicated that they might even wish to keep women after the war in some of these jobs. Other individual foundries mentioned special jobs in which their women excelled, such as clerical work, drafting, laboratory work, sand testing, operation of the heat-treat furnaces, and the making of small cores, and stated that women might be retained on these jobs. Many foundries agreed that women were better than men at the making of small cores. Whether, with the limited opportunities open to them and with the unpleasant environment of the foundry as a deterrent, women will care to remain in such jobs after the war is a question that cannot be answered at this time. It seems improbable that many foundries will be interested in retaining these small groups of women, even in jobs in which they excel, in an industry that is predominantly male.

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, Secretary
WOMEN'S BUREAU
FRIEDA S. MILLER, Director

Employment of Women in Army Supply Depots in 1943

BULLETIN OF THE WOMEN'S BUREAU, No. 192–8

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August 1, 1951

Army Supply Depots included in report

Employment of Women in Army Supply Depots in 1943

Name of plant	Location
Ordnance Depots	
Anniston Ordnance Depot	Anniston, Ala.
Charleston Ordnance "	North Charleston, S. C.
Letterkenny " "	Chambersburg, Pa.
Lordstown " "	Lordstown, Ohio
Pueblo " "	Pueblo, Colo.
Savanna " "	Savanna, Ill.
Sioux " "	Sidney, Nebr.
Terre Haute " "	Terre Haute, Ind.
Tooele " "	Tooele, Utah
Quartermaster Depots	
Quartermaster Depot	Ogden, Utah
" "	Savannah, Ga.
Medical Depot	
Denver Medical Depot,	Denver, Colo.

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" "	Savannah, Ga.
Medical Depot	
Denver Medical Depot,	Denver, Colo.

Anniston Ordnance Depot, Anniston, Alabama — March 11, 1943

(A new depot constructed by the War Department within the last couple of years and has been in active operation for about one year)

Employment of Women

Total	1469
Industrial	826
Office and Other	623

At time of agent's visit the following facilities were inadequate:

Food
Washing Facilities
Rest Rooms
Toilets (especially in igloo area, women have to be transported to toilets in tool room)
Seating
Weight Lifting Devices

A detailed report covering general recommendations and suggestions was sent by agent to Officer in charge. Many of the suggestions made by agent were in accord with plans being considered and developed by the officer especially in regard to additional food facilities, toilets, and wash rooms. In an interview with the Colonel, May 31, he told agent that gradually things were being accomplished, but still he was battling for money for toilets and washing facilities.

Women's Jobs

Most of the industrial women are classified laborers in the Ammunition and Warehouse Sections. The lowest pay for both men and women is 50¢ an hour, and munitions handlers receive 60¢.

(A wage reclassification study was being made.)

See attached

Formal recommendations made - See form schedule in Regional file.

Anniston Ordnance Depot, Anniston, Alabama March 8, 1943

Uniforms for Women

Most of the women throughout the packing and storage areas and throughout the warehouses visited were wearing some type of slacks or coveralls and for freedom of movement on the job this type of apparel would seem to be desirable. However a few women, chiefly those of middle age or older, were wearing dresses and one person said that there is resistance on the part of a few women to any plan to make the wearing of trousers of some type compulsory. In fact one woman at least is reported to have said that she would quit her job before she would wear pants.

Low-heeled shoes with closed toes are required, and shoes with safety toes are certainly desirable on many jobs. One officer said that powder shoes are desirable for persons working in certain areas, for example in the storage igloos but said that it is impossible to get these shoes now.

Denver Medical Depot, Denver, Colorado May 24, 1943

Employment of Women

Total	323
Factory	86
Office and Other	237

Toilet and Washing Facilities

The use of women was anticipated when buildings were erected and toilet facilities were included. In the two warehouses there are 6 toilet rooms, 3 with 4 toilets, 4 lavatories, and a bench each, and 3 with 5 toilets, 6 lavatories, and a bench each. No cots or chairs.

Lockers

Lockers are provided outside of women's rooms.

Seating

Stools with backs provided where women are working.

Heating

Both warehouses are heated.

Rates

Beginning rate for men and women	59¢
Prevailing rate for women	64¢

Women's Jobs

Ungraded:	
Messengers	6
Packers and selectors	40
Foreman packer	1
Unskilled labor	30
Foreman of laborers	1
C.P.C.	
Janitors	8
C.A.F.	
Clerks	175
RAM Operators	20
Draftsmen	0
Checkers	39
Nurses	3

No recommendations made since agent considered conditions very good.

Pueblo Ordnance Depot, Pueblo, Colorado June 2, 1943

Employment of Women

Total	470
Industrial	243
Office and Other	227

Food Facilities

Cafeteria in administration area only. No service in Ammunition and Combat Equipment area. (Some come in to cafeteria in buses) Two railroad cars with tables in ammunition area--no food served. Cafeteria is operated by depot.

Clothing

Beginning to require safety shoes in ammunition area and in other areas on some jobs. No other requirements.

Toilet and Washing Facilities

Facilities for women are inadequate in the areas. It was reported that portable privies are being built for ammunition and combat equipment area.

Drinking Facilities

Drinking facilities are provided in administration area, but the only provision in combat equipment area and ammunition area was by truck. Women claimed that the cans weren't clean, no cups were provided, and that the water was hot. Agent reported this to Officer in charge who made notation.

Heating

Warehouses in the combat equipment area are not heated in winter. There are stoves in certain locations with a sort of canvas partition around them and the women's rest room has a stove.

Weight Lifting

Several women reported that they had to handle materials that were too heavy, lifting up to 110 pounds (2 women). No limit has been set for weight lifting, but special attention is given to placement, suiting the job to the person.

Rate of Pay

Beginning minimum rate for women 46¢, for men 64¢. Rates were reported to be higher for men because of the difficulty in getting men to come to the depot to work. Men classified as Senior Laborers and women as Junior Laborers are doing the same work.

Junior Laborers - 46¢, 52¢, 55¢, 58¢.
73 Women were receiving 55¢
70 Women were receiving 46¢

Women's Jobs

Ungraded: (All classified as Junior Laborers)

Junior Laborers
Nailers
Helpers on saws
Pushing trucks
Stenciling
Munitions handlers

Other Classifications:

Saw filer (technician)
Chauffeurs
Gas Station Attendent
Junior Patrol
Radio operators
Property room
Checkers

Information recommendations made

Savannah Quartermaster Depot, Savannah, Georgia May 6, 1943

Employment of Women

Total.....	708
Warehouse.....	258 (61 negro)
Office.....	450

Working Conditions

Generally pleasant and favorable, "easy going" Southern atmosphere.

Rest Room Facilities

Had a rest room, gave it up because they needed the space and also women "abused the privilege." There is no formal rest period but women can relax when necessary. Canteens and Coca Cola machines are means of relaxation and refreshment.

Toilets

Adequate and conveniently located.

Eating Facilities

Several canteens and large cafeteria. Cafeteria closes at 6 p. m. as not enough demand for food to keep open. May re-open. Food good and cheap, but the service is slow. However, if time required for lunch runs over the 30 minute period, workers are allowed this extra time. Profits from cafeteria go to workers for recreation. There are some rooms with benches and tables where lunches from home can be eaten.

Weight Lifting

Negro women's work consists of loading and unloading freight cars. They lift cans of gasoline weighing 43 pounds. Agent was told negro women in this region are used to heavy work, have done heavy field work and can lift more than white women. Agent feels it unwise to complain about the use of negro women on this job without more specific knowledge of the job as agent had not observed the operation.

Uniforms

All in warehouses are supposed to wear slacks but all dont. All should wear safety shoes because of the danger from falling boxes. Safety shoes can be bought in Savannah, but many do not wear them.

Wage Policy

Equal pay policy. Often pay men more because men have "some skill." Raised on individual merit.

Minimum Beginning Rate:

61 Negro Women laborers (Warehouse section)
47¢ most women
50¢ men start here

161 Women Medical Warehouse
59¢ Selectors and packers
63¢ Checkers

Women's Jobs

Quartermaster Section:
Mostly storekeepers and checkers, and 61 negro laborers. (women)

Medical Section: (All white)
Collect supplies in small wooden carts to fill orders
A few women packers
Checkers

Office

No recommendations made.

Terre Haute Ordnance Depot, Terre Haute, Indiana August 3, 1943

Employment of Women

Total	217
Industrial	84
Office and Other	133

Toilet and Washing Facilities

Adequate in number. Too small for cots and chairs. Stove in each room.

Food Facilities

Cafeteria open for all shifts.

Clothing

No requirements of any kind. Women were wearing suitable clothing. No report on shoes.

Heating

Warehouses not heated in winter.

Rates of Pay

Beginning rate for men and women--72¢

46 Women - Ungraded Laborers ... 72¢, 80¢, 84¢ (Nearly all at 72¢)
38 Women - Graded Employees ... Most women on $1440 rates

Women's Jobs

Ungraded:

Tow and lift truck operator	33
Fork lift operator	7
Mechanics	2
Truck drivers	4

C.P.C:

Motor dispatchers	2
Chauffeurs	2
Messengers	6
Janitresses	7

C.A.F:

Checkers	21

No recommendations made

Sioux Ordnance Depot, Sidney, Nebraska June 9, 1943

Employment of Women:

Total	432
Industrial	311
Office and Other	121

Toilet and Washing Facilities

The number of toilets seemed to be adequate in the different areas and buildings.

Food Facilities

Cafeteria is depot operated and is in the administration area. Open 3 times a day for meals. There is also a sandwich and drink counter in the Post Exchange (open all day.) Inter-area buses bring employees in areas into the cafeteria at lunch hours (stagger so that all do not come at once.) Cafeteria is to be opened in Combat Area.

Clothing

No requirements, but expect to set up standards soon. Will require bandanas and safety shoes.

Heating

No heat in warehouses.

Drinking Water

Fountains provided where possible. Water is cold. A water truck serves the warehouse and ammunition area--cups provided.

Platforms and Stools

None provided in warehouse, crate shop, and ammunition area.

Weight Lifting

Women lift up to 75 pounds at low level.

Rates of Pay

Beginning minimum rate for men and women - 60¢
274 Women--Unclassified-- 60¢, 65¢, 70¢. Prevailing rate 65¢

Women's Jobs

Unclassified
Lift truck operators
Tow truck operators
Nailers
Saw operators

Unclassified (continued)

Checkers
Munitions handlers
Gang bosses
Laborers

C.C.C.

Messengers
Guards
Janitors

C.A.F.

Chauffeurs
Gas Station Attendants
Inventory
Supervisor (crate shop)
Ammunition inspectors
Chauffeur mechanic

(4 women trainees in school for optical repair)

No recommendations made

Letterkenny Ordnance Depot, Chambersburg, Pa. July 28, 1943

Work clothing requirements and practices

Women wear almost anything on the job. Often do not wear slacks. Wear dresses more often than slacks. No special rules. Depot is going to set up a store for supplying of safety shoes. Depot furnishes goggles for welders and chippers. Women wear slacks on fork-lifts and tractors.

Informal recommendations made

Ogden Arsenal, Ogden, Utah — April 15, 1943

Employment of Women

Total	2491
Industrial	2251
Office and Other	240

Working Conditions

Very good in the industrial area.
Housekeeping was unusually good. Most of the regular workers take turns at sweeping and waxing floors which goes on continuously and part of men come in later and stay to clean up at the end of the shift. Non-skid wax is used (Johnson's Traffic Coat). Large damp string mops to catch dust and dirt are placed at every doorway for workers to wipe their feet on and this regulation is generally observed. Officer in charge said that by making everyone a part of clean-up force the tendency is for most to be more careful of maintaining a high standard of cleanliness.

Drinking water - sanitary bubblers were convenient and adequate in number.
Salt tablets provided in summer.

Seating

Wherever the job is a sitting one chairs with backs are provided and for the majority these are good posture chairs. For standing jobs chairs are not generally available but these workers rotate on various jobs and not advisable to have chairs standing around in an explosives area where it might be necessary to leave quickly.

Cafeteria and food Service

Every unit in industrial area has a lunch room where a hot food is brought from central area kitchens. A plate lunch is available for 35¢ and individual items can be purchased at reasonable rates. Chairs and tables are available. Also, some of the change houses have tables and chairs where lunches can be eaten if worker does not go to cafeteria.

Change Houses and Toilet and Washing Facilities

A change house with lockers, toilets, shower baths and washing facilities is provided for every unit. Matron in charge of each of these. Also, each building has toilets and washing facilities. Maintenance of toilet facilties very good and number was adequate. More showers for women had recently been installed in some of the units.

Uniforms

Both men and women are furnished coveralls, two clean ones each week. Matron in charge of change house has charge of distribution of uniforms. Shoes--safety with fibre toe provided free for all workers in the industrial area. Women are required to keep hair tied down in a bandana. Some of women complained of these but officer in charge felt they were necessary to keep powder dust out of hair as well as keeping hair confined and felt that unless provision was generally enforced even in inert sections that it would not be observed.

Formal recommendations made (See firm schedule)

Quartermaster Depot, Ogden, Utah April 15, 1943

(Construction of depot did not anticipate employment of women in warehouses)

Employment of Women

Total..... 3067
Warehouse..... 2787
Office..... 280

Toilet and Washing Facilities

A. Present Conditions
Very inadequate for women in most of warehouse sections. In some 200 women are using toilet facilities for less than 50, and washing facilities are also inadequate.

B. Recommendations by agent
Women's Bureau Bulletin #4 be consulted and immediate plans be made for new construction.

Eating Facilities

A. Present Conditions
The central warehouse cafeteria serving good and reasonably priced food is not accessible to many of the warehouses.

B. Recommendations by agent
Many workers prefer to carry lunches and a space with chairs and tables should be set aside in the warehouses remote from the cafeteria. Also a mobile canteen serving hot drinks, milk, and sandwiches would be advisable.

Lockers, Cloak Rooms, and Rest Rooms

A. Present Conditions
Some warehouses had these facilities in connection with the toilet room, but in many there were no such arrangements or they were inadequate. Cots and benches were installed in some of the toilet rooms.

B. Recommendations by agent
More locker or cloak room facilities, and cots and if possible rest rooms separate from toilet rooms.

Seating

A. Present Conditions
Seating provisions generally disregarded. Women on sitting jobs often sat on boxes, some of the "standing" jobs have some work which could be done sitting (storekeepers and packers).

B. Recommendations by agent
Chairs or stools with backs should be provided.

Drinking Fountains

Recommendation by agent
Additional ones are needed--the number should be doubled or trebled.

Uniforms

Recommendation by agent
Regimented uniforms not needed, but clothing safe for job should be required, and low heeled, safety toed shoes are generally needed.

Weight Lifting

A. Present Conditions
Women were doing heavy lifting. Women in teams of two were observed lifting, carrying, and stacking loads which weighed over 100 pounds.

B. Recommendations by agent
1. Women should be instructed in best methods of lifting and carrying loads.
2. Women assigned to weight lifting jobs should be physically approved by medical department.
3. Safety department should check and be responsible for determining the suitability of these jobs for women.

Wages, Job Classification, and Upgrading of Women

A. Present Conditions
Same wage classification for men and women, but often less consideration is given to advancement of women. About ½ of the warehouse employees are graded employees (clerks, storekeepers, checkers), the other half are classified as laborers except a few carpenter's helpers. The laborers hourly rate is 69¢.

B. Recommendation by agent
Women should be afforded same opportunities as men for reclassification to higher earning grades.

Women's Jobs

Fork lift operator
Tractor operator
Storekeepers
Checkers
Packers
Box and crate makers
Preparing automobiles and heavy mobile equipment for dead storage.
General laborers
Messengers
Chauffeurs
Truck Drivers
Patrolmen and guards
Clerical

Note: Recommendations sent by Women's Bureau to Officer in Charge. No follow-up.

(See form schedule 1st 2 pps)

April 30, 1943

"The copy of their (agents') recommendations which you have furnished to us will be carefully reviewed in effort to correct any undesirable conditions, to increase the percentage of women employed where character of work concerned will permit, and to reduce turnover and absenteeism amongst women employees."

Joe. S. Underwood
Colonel, Q. M. C.

Toocle Ordnance Depot, Tooele, Utah March 23-26, 1943

Employment of Women

Total.....	187
Industrial.....	35
Office.....	152

Shift Rotation

A. Present Conditions
One shift at present. When full capacity is reached there may be three shifts. As yet no plans for rotation except in salvage department (where most of the industrial workers are employed). Weekly rotation had been considered.

B. Recommendation
Weekly rotation too frequent for maintaining health of workers.

Working Conditions

The operations and activities of the Tooele Depot were still in beginning stage. Construction had not been completed so the following data were taken from architect's drawings.

Toilet and Washing Facilities

Seemed adequate.

Rest Rooms, Lockers or Cloak Rooms

The provisions seemed inadequate or entirely lacking in some buildings. Commanding officer stated that additional facilities not shown on drawing have been planned and he believed that they were adequate.
Agent's comment: Where women are employed on jobs requiring constant standing and physical activity, rest rooms equipped with chairs, couches, benches, etc. are needed.

Cafeteria and Food Service

A central cafeteria is to be built in the shop area and another in the administrative area. However, since many women will probably prefer to carry their lunches, rest rooms should have chairs and tables for accommodating these. Lunch wagons or mobile food canteen service providing hot drinks, milk and supplementary food items is advisable for buildings which are not convenient to the cafeteria.

Platforms

Where workers must stand on cement floors, fatigue can be reduced by providing wood platforms or mats of some kind.

Drinking Fountains

Sanitary bubbler supplying cool water should be available in all workrooms. In summer months when temperature is high, free provision of salt tablets is recommended.

General recommendation on working conditions

Agent suggested that department heads and officers in charge consult Women's Bureau Special Bulletins on standards for working conditions, safety, and health. Copies of these were provided for the Commanding Officer.

Wages of Women's Jobs

See Quartermaster Depot, Utah. Wage reclassification for Utah area to go into effect April 1, 1943.

Women's Jobs

At time of visit two-thirds of women were employed in clerical activities.

Industrial and plant service:

Guards	11
Checkers	3
Dispatchers (car)	3
Drivers	14
Salvage - laborers	29
Salvage - checkers	3

Note:
Tooele Depot is located on the desert three miles from the mining camp of Tooele, 40 miles from Salt Lake City. The heat is intense in summer and it is severly cold in winter. The dormitories built by F. H. A. are not desirable or acceptable to most women and are not comfortably furnished. Also transportation to Salt Lake City is very inadequate. For these reasons it is difficult to secure workers and to maintain a stable labor force.

Formal recommendations made

WAGE RATES

At the time of the Women's Bureau agents' visits to the arsenals and depots there was a marked sex discrimination in wage schedule and job classification. Since that time new schedules have been set up by the War Department in these establishments. However, the attached wage schedule for October, 1943, in the Savanna Depot, Savanna, Illinois, shows a difference of $1.28 per day between men and women laborers and in the two jobs where women only are employed, the beginning rate is $4.48 while the lowest rate for men on any job is $5.28.

General Recommendations:
Graded and labor classification for women should be the same as for men. Women should not be expected to be content to stay in the lower classifications and the rates of pay should be the same as those of men for the same or comparable work. They should be eligible for promotion and training for higher paid jobs. Also supervisory material should be looked for among women.

Oct. 1943

Savanna Ordnance Depot, Savanna, Illinois

Rates of Pay

	Men's - Daily Rates			Women's Daily Rates		
	Beg.	30 days	90 days	Beg.	30 days	90 days
Laborers	$5.28	$5.76	$6.24	$4.00	$4.48	$4.96
Assemblers Small Arms Plant (All women)				$4.48	$4.96	$5.44
Foremen of laborers	$6.16	$6.56	$6.96	$6.16	$6.56	$6.96
Checkers (All women)				$4.48	$4.96	$5.44
Heavy Duty Truck Drivers	$5.76	$6.24	$6.72	$5.76	$6.24	$6.72
Mechanics (Garage)	$6.16	$7.12	$8.08	$6.16	$7.12	$8.08
Munitions handlers (All men)	$5.76	$6.24	$6.74			
Fork Lift Operators	$5.76	$6.24	$6.74	$5.76	$6.24	$6.74

Guards (Gate) $1500 per annum for men and women
Janitresses $1320 per annum
Maids (Civilian Housing) Non Civil Service $4.96 per day

Advancement on jobs above the three steps given is on merit.

Products handled

Ordnance Depots, Quartermaster Depots, and Medical Depots - 1943 Surveys used in Report

D-832

Name | Product "Army Supply Depots in 1943"

Map & C numbers.

Ordnance Depots

20. Anniston Ordnance Depot, Anniston, Ala. — Primarily a storage depot for amm., bulk powder & explosives for general supplies storage in warehouses. Some re-packing & crating of amm. as well as some renovation work.

21. Charleston Ordnance Depot, North Charleston, S.C. — Loads & stores all types of amm. Both domestic & overseas shipments come thru it. (Only Ord. Depot in 4th Service Command)

22. Letterkenny Ordnance Depot, Chambersburg, Pa. — Receives, preserves, stores, and issues automotive parts & general supplies (expects to handle 400,000 items) Also has large area for storage of amm.

23. Pueblo Ordnance Depot, Pueblo, Colo. — Receiving & storage of amm. - shells 37s - 105s, bombs 500 lb. - 1000 lbs., ethyl alcohol, fin assemblies, tank tracks, medical supplies, mattresses, sheets, blankets, pajamas. Issuing on small scale as yet (Ships about 1 Car in 1 or 2 days.)

24. Savanna Ordnance Depot, Savanna, Ill. — Receiving, storing & shipping amm. Store 155 mm Howitzer powder charges, powder, small arms amm., bombs up to 2000 lbs. Also a clipping plant - 30 & 50 calibre amm. are rec'd & clipped into bandoleers or placed in cartridge belts. Also salvage used amm. cases.

25. Sioux Ordnance Depot, Sidney, Nebr. — Receiving, storage & issuing to other depots & ports of embarkation of general ordnance supplies; tank tracks; amm. - 100-500 lb bombs & 4.5 in - 240 mm shells; bomb fins, practice bombs, small arms; motor storage (passenger cars).

26. Terre Haute Ordnance Depot, Terre Haute, Ind. — Receiving, storage & issuing general ordnance supplies (wholesale - no broken down lots)

27. Tooele Ordnance Depot, Tooele, Utah — Amm. supply & storage, combat vehicle supply & repair, repair shops for artillery equipment, small arms, fire control instruments & amm. salvage.

Ordnance and Quartermaster Depots (cont'l)

Name	Product
~~Quartermaster Depots~~	
Naval Supply Depot, Clearfield, Utah	~~Wholesale distributor - no goods issued directly to naval operations. Supplies moved to sub-depots that issue to ships & naval operations. This largely eliminates packing~~
28. Denver Medical Depot, Denver, Colo.	Receiving & issuing medical supplies; hospital, surgical & dental supplies; mess, x-ray, laboratory & field equipment; misc. supplies
29. Lordstown Ordnance Depot, Lordstown, Ohio	One of 4 master depots in supply of tools, mostly automotive. Have a few trucks & jeeps in storage here but have mostly parts, tools & equipment for machines. Receive, clean, preserve, wrap, pack, store & issue. Also make boxes & crates for packing, also bags for lining & concrete. No explosives or munitions handled here.
30. Quartermaster Depot, Ogden, Utah	General supply & storage depot for Quartermasters, Engineers, Ordnance (motor transportation), Signal Corps, Medical & Chemical Warfare divisions of the Army. (QM's office has general supervision of the depot)
31. Savannah Quartermaster Depot, Savannah, Ga. X	Receive, store and issue food, clothing, various kinds of mobile equipment, delousing equipt., refrigerators, medical supplies - practically everything but ammunition. (has quartermaster section and medical section - CDC)

REPRODUCED AT THE NATIONAL ARCHIVES

August 1, 1951

Army Supply Depots included in report

Employment of Women in Army Supply Depots in 1943

Name of plant	Location
Ordnance Depots	
Anniston Ordnance Depot	Anniston, Ala.
Charleston Ordnance "	North Charleston, S. C.
Letterkenny " "	Chambersburg, Pa.
Lordstown " "	Lordstown, Ohio
Pueblo " "	Pueblo, Colo.
Savanna " "	Savanna, Ill.
Sioux " "	Sidney, Nebr.
Terre Haute " "	Terre Haute, Ind.
Tooele " "	Tooele, Utah
Quartermaster Depots	
Quartermaster Depot	Ogden, Utah
" "	Savannah, Ga.
Medical Depot	
Denver Medical Depot,	Denver, Colo.

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Letter of Transmittal

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, December 21, 1944.

MADAM: In the critical manpower-shortage period of 1943 the Women's Bureau was requested by a number of Army Depot Commanders to assist them in determining the jobs in which more women could participate in depot industrial operations and the conditions under which they should be employed.

Some of the Bureau's most experienced industrial agents were assigned to visit several depots. They found that modern mechanized equipment, scientific personnel, and job-organization practices had made possible the employment of large proportions of women in Army warehousing jobs that in the past were considered unsuitable for women.

The findings summarized in this report should prove of value not only to all Depot Commanders but to industrial warehousing establishments.

A copy of the report was submitted to the War Department and received the approval of the Chief of Civilian Personnel of the Ordnance Department.

The depot visits were made by Ethel Erickson and Martha J. Ziegler. The report has been written by Caroline A. DeCaux.

Respectfully submitted.

FRIEDA S. MILLER, *Director.*

Hon. FRANCES PERKINS,
Secretary of Labor.



Courtesy U. S. War Department

WOMAN OPERATOR USING FORK-LIFT TRUCK TO PICK UP AND REMOVE 3 TIERS OF MILITARY SUPPLIES FROM STACKS IN ORDNANCE DEPOT WAREHOUSE.

Employment of Women in Army Supply Depots in 1943

SUMMARY AND RECOMMENDATIONS

SUMMARY

Origin of Study.—In 1943, representatives of the Women's Bureau were requested by several Army Supply depots to assist them in determining the jobs in which more women could participate in depot industrial operations and the conditions under which they should be employed.

Employment of Women.—When these depots were visited, women already made up close to one-third of their total civilian force and more than one-fourth of the force in the industrial sections.

Women's Jobs.—Though employment practices of the depots varied, women were seen at work in every branch of industrial operations. They were loading, unloading, transporting, stacking, checking, packing, inspecting, and crating military supplies; they were employed in box-, crate-, and bag-making shops; and in depot repair, maintenance, and office jobs. Many were doing clerical and relatively light unskilled industrial work, but a large proportion were on indoor and outdoor jobs that required considerable physical endurance and varying degrees of skill, and some were in supervisory jobs. All depots still employed men on work that women could do, but several were planning to increase substantially the number of women workers and were trying them out on new jobs.

Depot Variations.—Wide variations were found between depots in the number of women employed and the type of jobs in which they were working. Some employed very few women and restricted them to three or four occupations; in others, women made up a large proportion of the industrial force and were seen working in every subdivision of depot operations.

Factors Limiting Employment of Women.—Though the extent to which women were or could be used in depot industrial operations depended in large part on the weight and bulk of supplies handled, the availability of men in the local labor market was one of the principal factors influencing the employment of women in industrial operations.

Experience and Training.—Most women were inexperienced when hired and were trained on the job. A small proportion in more skilled jobs received supplementary training at the depots and some were sent for additional training to vocational schools or Government arsenals. In most depots women in supervisory jobs were required to take Job Instruction Training and Job Relations Training courses.

Age of Women.—The majority of the women were under 35 years of age, but in several depots a considerable number were over 40 and some were above 50 and 60.

Work Schedules.—Practically all women were full-time employees and worked on an 8-48-hour schedule. In some depots they put in a considerable amount of overtime, which occasionally included Sundays. In most depots that had more than one shift, women were employed on all shifts.

Wage Rates.—Beginners' rates for women ranged from 46 cents to 72 cents an hour, and a large proportion still were receiving these minimum rates. Though no rate differentials were permitted on the basis of sex, and women received the same rates as men when employed in the same grades or job classifications, men generally were in the job classifications that provided the higher rates. When visited, several depots were considering the question of wage advancement for the more experienced and more skilled women.

Absenteeism and Turn-over.—In most depots where reports were obtained, absenteeism and turn-over rates were approximately the same among men and women, though many women were married, had household and child-care responsibilities, and in some cases spent 2 to 4 hours a day traveling to and from work.

Efficiency.—No statistics on relative productivity of men and women were obtained or available, but in a number of depots women were praised as satisfactory, good, careful, or efficient workers, and even "wonderful" workers. Accident reports obtained indicated fewer and less serious accidents among women than among men.

RECOMMENDATIONS

The principal methods for increasing the employment and efficiency of women and for safeguarding their health that were already in use in some depots, and those recommended by Bureau representatives, included the following:

Placement.—Careful attention to physical condition, age, height, weight, aptitudes, for the purpose of placing women on jobs for which they seem best qualified. Employment of women on work that they already are doing well in other depots.

Training.—Training of inexperienced workers in proper methods of handling even the simplest tools and in correct methods of lifting and carrying weights. More extensive job-method training for supervisors so that they may be better equipped to rearrange the work and make it easier and safer for women. Universal instruction in depot safety rules and depot operations.

Reorganization of Jobs.—Subdivision of heavier jobs where possible into two or more operations on which some women, or only women, can be used. Employment of mixed crews on operations involving only some or only occasional heavy work.

Lifting Devices.—Wider use of automotive and other handling equipment to facilitate the employment of women on jobs that involve handling of relatively heavy materials.

Seats and Platforms.—Provision of seats on jobs wherever feasible, as a means of reducing the strain and increasing the efficiency of women workers. Provision of proper floor board on jobs that require continuous standing on concrete, and of wooden platforms for short women where necessary.

Working Hours.—Formal rest periods during working hours, and as little overtime as possible, especially for married women.

Wages.—More attention to upgrading and wage reclassification of women on the basis of experience and actual work performed.

Supervision.—More extensive use of women in personnel relations and in supervisory jobs.

Facilities.—Provision of adequate toilet, washroom, and eating facilities, and of adequate housing in depots located in isolated areas.

ORIGIN OF STUDY

Wartime establishments of the Army Service Forces were among the first agencies of the Government to recognize and stress the necessity of meeting growing labor shortages through widespread employment of women.

The most rapid expansion in the operations of Army supply depots located in continental United States occurred in 1942 and 1943, when many sections of the country were already confronted with serious labor shortages, when in many areas women made up the principal reserve of available labor, and when most war industries had already demonstrated that women could be successfully used on jobs never before considered suitable for them. Under these circumstances it was natural for the Army Service Forces [1] to urge their employment on all depot work that they could perform without injury to their health.

Though most warehousing and other industrial-depot jobs had been traditionally considered men's work, the Civilian Personnel Division of the Army Service Forces requested depot commanders to aim in 1943 at filling 60 percent of the depot jobs with women.

As a step in carrying out more rapidly this policy of maximum employment of women, a number of depot commanders and zone chiefs asked representatives of the Women's Bureau to visit their respective establishments and assist in determining on what additional jobs women could be employed and advise on the conditions under which such work should be performed.

In the course of these visits, the jobs in which women already were working successfully were noted. New jobs on which women could be employed were ascertained. Consideration was given to such factors as use of engineering devices, reorganization of jobs, employment and placement procedures, and other employment practices and conditions that had a bearing on the availability, employment, health, morale, and efficiency of women workers.

Representatives of the Women's Bureau submitted their recommendations to depot commanders and addressed depot personnel and officers in various sections of the country.

[1] The Army Service Forces is composed of two main divisions, the Administrative Services and the Supply Services. The depots are a part of the latter and they store and handle equipment and supplies for the Corps of Engineers, the Quartermaster Corps, the Ordnance Department, the Chemical Warfare Service, the Signal Corps, the Transportation Corps, and the Medical Department. The duties and functions of these services are to provide the fighting forces with food, shelter, clothing, and arms; to transport men and equipment throughout the world; and to care for the wounded. Each of these Services has special depots for its supplies, but some depots store and issue supplies for more than one Service.

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As the demands upon the Bureau's limited staff were too many to permit it to meet all requests for visits, it is believed advisable to bring together the results of the observations for the benefit of all depot commanders. A record of women's employment in depots is deemed essential also for future planning. This report on employment of women in depots contains information similar in character to that secured in several other war industries by the Women's Bureau.[2] These earlier reports have been used widely by Government agencies and private war-production establishments as guides to the employment of women on work on which they had not been employed before the war.

NUMBER OF DEPOTS AND THEIR EMPLOYMENT OF WOMEN

Number and Type of Depots Visited.

In the spring and summer of 1943, 12 Army Supply depots, employing not far from 35,000 workers, were visited by representatives of the Women's Bureau. These depots received, stored, and issued for shipment Ordnance, Quartermaster, Medical, Engineering, Signal Corps, Transportation, and Chemical Warfare supplies. They handled hundreds of thousands of items, which varied greatly in type, size, bulk, and weight. Their stock included cartons of aspirin as well as X-ray machines and complete equipment for hospital units; light automotive parts and tools as well as 1,000- and 2,000-pound bombs; boxes of underwear as well as fire-control instruments, cannon, tanks, and jeeps.

Nine were Ordnance depots and seven of these had, in addition to other supplies and storage facilities, extensive ammunition areas where high explosives and ammunitions of all types were stored in magazines and igloos.[3] One was a "master" depot for automotive equipment, tools, and parts. One was a wholesale establishment for general ordnance matériel where supplies were stored in bulk and issued only in unbroken lots to other depots.

Two were Quartermaster depots. One of these stored both medical and quartermaster supplies; the other, equipment of all the seven Supply Services.

One was a Medical depot, which handled all types of medical and some quartermaster supplies.

All establishments performed the normal warehousing operations involved in receiving, storing, and shipping supplies. In addition, a number had shops or sections for the repair of military equipment; one had a small-arms clipping plant; two had ammunition-popping plants; and two bag- and shell-loading plants.[4]

The depots varied considerably in size and in number of workers employed. One consisted primarily of 3 large warehouses; another

[2] For example, aircraft, ammunition, cannon and small arms, machine tools, steel, foundries, ship building and repair.

[3] High explosives and ammunition of all types, except small-arms ammunition, may be stored only in ammunition areas, and these must be some distance from administrative buildings, other depot structures and areas, and public highways and buildings. They must be stored in aboveground magazines or semiunderground igloos, spaced at considerable distances. Small-arms ammunition is not considered an explosive hazard and may be handled in areas where other supplies are stored.

[4] For a description of women's work in bag- and shell-loading plants see Women's Bureau Bul. 192–2, Women's Employment in Artillery-Ammunition Plants, 1942.

occupied an area of over 400 acres, and 1 an area of 38 square miles. One employed less than 800 workers; another close to 8,000. Several of the depots were in labor-shortage areas; a number were in sparsely populated and other semirural sections. A few reported that they were drawing their labor supply from distances of 30 to 65 miles. Most depots were new establishments that were constructed or began operations only in 1942. Two were old depots that had expanded operations rapidly in the year preceding the visit. Seven reported that they planned to expand operations further and their estimates for additional workers ranged from less than 300 to approximately 3,000. Two depots had reached their employment peak and 2 planned to reduce the total number of workers, but 1 of these 4 planned to increase employment of women and 1 expected no change in this.

Employment of Women.

Though employment of women in depot operations was a new, wartime development, when the 12 depots were visited they already employed more than 11,000 women, about 7,000 of whom were working in the warehousing and other industrial sections. In one depot almost half the workers in the industrial sections, and in another almost 90 percent of the office workers, were women. The commander of a depot that had a large proportion of women expressed his attitude toward their employment in the following words: "We like women very much here and think they can do almost everything. We ask, not 'What can a woman do?' but 'What is there that women cannot do?' "

This contrasts sharply with depot attitudes and practices during World War I. A Government report of a depot survey made in the fall of 1917 makes this statement: "But women are unfamiliar figures in Government storage depots, and to many officers of the Army the suggestion that they may later be employed seems a flight of fancy." [5] That report also revealed that in some of the depots women were not employed even in clerical occupations in 1917, and in only one of the establishments visited were women employed in such simple operations as packing of stationery and dental supplies. The only other industrial operation in which women worked was the inspection of clothing.

Even in 1943, however, considerable variation was found in depot employment practices. While between 30 and 35 percent of all civilian workers were women, the proportion in the industrial sections ranged from just over 12 percent in 1 case to more than 45 percent in another.

Figures showing total workers and the number of women in the industrial sections were secured from 10 establishments. In 5 they made up 25 percent or more of the civilian force, and in 5 the proportion ranged from just over 12 to 19 percent. The largest depot, with close to 8,000 workers, also had the highest proportion of women in industrial sections. In three of its warehousing branches women held between 52 and 72 percent of the industrial and clerical jobs.

Considerable variation among depots was found also in the type of jobs in which women were working. Some had women in every

[5] Employment of Women in the Storage and Warehousing Depots of the United States Army. Prepared by Mary van Kleeck, 1917.

subdivision of depot operations; in others women were restricted to four or five occupations.

Several factors seemed to account for the difference in these employment practices. The weight and bulk of the materials handled regularly or occasionally determined in part the extent to which women could be employed.

A more important factor, however, was the availability of other labor. The five depots with the largest proportion of women were in labor-shortage areas—some described as acute. In one of these, the United States Employment Service and the Office of Civilian Defense in the area made a door-to-door campaign for enrollment of women. The USES representative stated that his office had no difficulty in convincing management that women could be used—the problem was rather where to get the women for the jobs that were available. One depot was 1,000 workers short at the time of the visit. On the other hand, six depots with the lowest proportions of women were in areas where the labor supply was considered adequate or surplus, one of these in an area where Negro men still were available.

Another factor that unquestionably restricted the employment of women was the attitude of supervisory personnel. The use of women on fork-lift trucks provides perhaps the most striking example of this. At one depot only men were employed on this work, and it was considered unsuitable for women—partly because men operators had had several serious accidents while driving these trucks. At the same time a number of depots in other sections of the country were employing women chiefly, and were training only women for this work because they had proved very safe and careful operators.

All depots still were employing men on jobs that women could do. A number were training or trying out women on new jobs previously restricted to men and several reported that they planned to increase substantially the proportion of women.

DEPOT FUNCTIONS AND WOMEN'S JOBS

Functions of Depots.

Army supply depots are primarily warehousing establishments. Military supplies manufactured in thousands of plants throughout the country are here assembled into logically related groups and stored until issued for use in training or combat. Depots are a vital link between the production line and the fighting line and perform an important function in the timely and safe delivery of supplies to the armed forces.

The main function of depots is to receive, store, inspect, and issue supplies. Generally they do not manufacture any materials, but they are responsible for maintaining stock in serviceable condition and this frequently involves production operations similar to those performed in manufacturing establishments where the materials were originally produced. Depots are described by the War Department as supply establishments for the reception, inspection, classification, storage, issue, repair, or salvage of supplies, or the performance of other special functions as directed by higher authority. Depots are responsible also for maintaining their stock at levels adequate to

supply the normal needs of all units allocated to them for supply purposes.

As just stated, the warehousing work involves handling rather than production work. It consists primarily of the following operations: Unloading supplies received; unpacking and inspecting loose-issue supplies; assigning and transporting or carrying supplies to their proper storage locations and stacking them according to depot specifications; repacking supplies received in damaged containers; inspecting and segregating deteriorating supplies while in storage; locating, selecting, packing, and marking supplies for shipment; transporting supplies from storage areas or packing lines and loading them into freight cars or trucks for shipment; checking supplies when received, packed, and issued.

The work of depot employees is not, however, limited to warehousing jobs. Maintenance of supplies in condition suitable for shipment and use includes such work as the inspection, repair, repainting, disassembling and reassembling of deteriorated or damaged supplies. It may also involve the production and replacement of broken parts.

A considerable number of workers are employed also in the depot box-, crate-, and bag-making shops, in the sections where components of damaged supplies are salvaged, and in various depot maintenance jobs.

Women's Jobs.

Most of the women in depot industrial sections were employed on warehousing jobs. They were loading, unloading, stacking, and storing supplies received and issued. They worked on numerous packing and crating jobs. Many were on laboring crews that unloaded, salvaged, and stacked lumber, boxes, and other materials used in depot operations. Many were employed in packing, crating, and box-making shops or sections. A considerable number were checking incoming and outgoing supplies and performing factory clerical jobs in the storage and other industrial sections. Some were working in the equipment-repair and depot-maintenance shops, and on other depot-maintenance jobs.

The jobs of women varied greatly in skill, nature of work, and physical endurance required. Many were of a clerical and other relatively light nature, but a large number were jobs that required considerable physical endurance. Most of the women were doing relatively unskilled work, but a small proportion were on more highly skilled jobs that required a good deal of training and knowledge of depot operations. A number were employed in supervisory positions.

The use of women was generally more restricted in sections where very heavy and bulky supplies were handled. This limited in part their employment in some ammunition areas and in depots where supplies were stored and issued in unbroken lots.

Women did, however, work on many jobs that involved the handling of relatively heavy weights. Their extensive employment on such work was made possible by several factors and depot practices. The most important of these was the wide use of mechanical handling equipment, such as conveyors and fork lift trucks in loading, unloading, stacking, and packing operations; and the use of various other motorized vehicles for transporting supplies within the warehouses or from one depot area and section to another.

In a number of depots the practice of subdividing jobs into several operations, and assigning men to those tasks that involved too-heavy weight lifting or too much strain, also made possible the employment of many women on work that otherwise might have been considered unsuitable for them.

Another variation of this practice was the use of mixed crews on jobs that involved occasional handling of supplies that were too heavy for women. Men on such crews at times performed the lighter work that women could do, but their presence for the occasional heavy work made possible the use of a considerable proportion of women.

A very important factor was the careful placement policies of some depots where younger and stronger women were assigned to jobs that required considerable physical endurance while older women were used on lighter work. Another method was the practice of assigning two women to handle weights that were too heavy for one.

A considerable proportion of women were classified as laborers. They were, however, performing many different types of work and could be shifted around from one job to another. The job descriptions that follow, therefore, relate generally to the work women were actually doing rather than to their pay-roll classifications.

DESCRIPTIONS OF JOBS

Fork-Lift-Truck Operators.

Loading, unloading, transporting, and stacking supplies are among the principal industrial tasks in depot operations, especially in wartime when materials are continuously moving in and out of storage.

Fork lift trucks were used extensively in a number of depots for this work, and in such depots a large proportion of these trucks were operated by women.

The fork lift truck, which has revolutionized warehousing procedures, is a modern time-and-labor-saving machine. One woman operating such a truck can, unaided, pick up, transport, and stack a load up to a ton or more in a fraction of the time and with a fraction of the effort it would take to do this work by any other method.

These trucks are relatively small gasoline- or electric-powered vehicles equipped in front with heavy protruding forks and a tall guard to prevent the load from falling over. The operator who drives the truck manipulates levers that raise or lower the forks and guides them into the pallets[6] on which many supplies are stacked, or under skids and crates especially constructed for the fork-lift operations.

The operator can drive the truck into a freight car, motor truck, or warehouse, pick up a load of supplies stacked on pallets, convey the load to the assigned storage place, and deposit it in any designated location simply by raising or lowering the load and pulling the forks out. Several tiers of packed boxes stacked on pallets can be handled at one time. (See frontispiece.)

In 1 of the depots a warehouse bay that contained 30,000 boxes weighing each from 100 pounds to 1 ton was pointed out as an excep-

[6] Many supplies stored in depots arrived or were stacked after receipt on pallets or palletized boxes. Most pallets seen were either small platforms raised on cleats, or platforms consisting of an upper and a lower section joined in such a way as to leave an opening a few inches wide to allow the entry of the fork-lift prongs.

tionally fine stacking operation done by 1 woman fork-lift operator. Women were seen operating these trucks in and out of warehouses and freight cars; on loading platforms and docks; in the ammunition and other depot areas. They were loading, unloading, and stacking ammunition, other military equipment and supplies, as well as materials used in depot operations.

In a number of depots where large proportions of the fork-lift operators were women they were praised as good and very careful workers. In one case they were described as "wonderful workers," able to do practically anything that could be done with a fork lift. In another, where more than three times as many women as men were employed, the foreman said that women were very skillful and careful stackers and that he expected to have only women operators soon. In a third depot, also with many more women than men, only women were being trained to operate fork lifts.

These trucks are simple but sensitive vehicles. They turn over easily, and swerve or bounce back if they hit a bump or stone. The operator is in danger not only of falling off the truck—it may be onto railroad siding—but from the falling of loads carried on the forks. When these machines are used on crowded platforms, in the limited space of freight car or warehouse, or in ammunition areas where other motorized equipment, supplies, and workers are constantly moving, the operator must have a good deal of skill in handling the truck. She must be able to stop and start again quickly in tight places, to drive forward and backward, around corners and stacks, and on the edges of crowded platforms.

Notwithstanding the fact that women were considered exceptionally good workers in the depots where they operated fork lift trucks, some depots had not begun to use women on this work. In one where a large number of trucks were used, only men operators were considered; in three others women were being trained, and in one of these it was stated that if the first woman proved successful, more women would be employed.

Operation of Other Trucks, Tractors, and Vehicles.

In addition to fork lift trucks, women were operating cargo trucks, tow trucks, various types and sizes of trailer trucks and tractors, carryalls, pick-up cars, jeeps, and other vehicles used for transporting supplies and workers between areas and inside warehouses. Most of the trucks operated by women were not above 1½-ton capacity. However, in three depots it was reported that women were employed on heavy-duty trucks; in one a woman spoke of operating 3-ton trucks; and in another women drove 2½-ton trucks and powerful tractors with large trailers transporting heavy and bulky loads.

In some depots women drivers were required to know how to make simple repairs on their vehicles. In one it was specifically indicated that neither men nor women drivers had to do any loading or unloading. One depot that had a serious shortage of labor apparently was not employing women truck drivers because drivers were required also to load and unload. Some of the women who operated trucks with long strings of trailers coupled and uncoupled the trailers at the proper destinations.

Most women operated vehicles only within the depot areas; in only two depots was it stated that some women truck drivers were occasionally assigned to short trips outside the area.

In one depot where women drivers were praised as good workers, each was taught to operate one car and used the same car when shifted to various areas or to work with different groups.

Driving these vehicles in depot areas called for more than ordinary skill and involved some hazards. Special safety rules had to be observed while operating in ammunition areas. Skillful driving was essential on the crowded platforms and ramps and in the limited aisle space of warehouses. At times, cars with loaded trailers fell off platforms onto railroad tracks. In one of the depots it was reported that falling off the ramps happened often enough to constitute a real hazard. Some accidents to women were reported, but none were serious and in a number of depots the women were praised as careful drivers.

In a depot where women operated trucks up to 2½-ton capacity, it was reported that after a few months some stayed away from work frequently. Others, however, "stick well to their job", according to the foreman, who estimated that 80 percent of the women truck drivers were good or excellent and 20 percent were fair. In the same depot women who operated Clarkats that pulled long strings of low trailers were considered better than men, though these "cats" were somewhat hard on the driver, since they were small, had no springs nor soft tires, and were easily jounced about. In another depot where women drove 1½-ton trucks the officer stated that they had worked out very well, and in still another where women drove carry-alls and pick-up cars the officer stated that they had proved very efficient workers.

Not all depots visited employed women for driving trucks or other vehicles used for transporting supplies, but in practically all women were driving passenger cars or station wagons, buses, carry-alls, and other vehicles used for transporting personnel inside and outside the depot area, or for carrying messages. In one depot women also drove the water trucks in the administration area, and in another they occasionally drove the combat vehicles brought to the depot for storage or repair.

Manual Loading, Unloading, Stacking, and Salvaging.

A large number of women employed on depot laborer crews were performing various manual jobs. At the time of visit, many were loading, unloading, and stacking ammunition and other military supplies, and were unloading, stacking and salvaging lumber, boxes, and other materials used in depot operations. Much of this work was performed in open or semiopen areas.

Loading, Unloading, Stacking.—Women were seen unloading chests filled with engineering equipment. Some were working as "hookers", putting on or taking off crane hooks from huge crates and steadying the crates as they were loaded or unloaded from or into boxcars. In three depots women were loading, unloading, and hand-stacking ammunition in the igloo areas, a number of them using hooks for lifting and stacking shells. Some slowed or accelerated the movement of bombs passing along skids during loading and unloading operations. Others loaded and unloaded boxcars of ammunition when the work was not too heavy. In several depots crews of women were seen loading, unloading, stacking, and salvaging lumber and boxes.

Some of these crews were composed largely or entirely of women, with the men assigned principally to the handling of supplies too heavy for women. On some crews, however, men and women were doing the same work.

Women who were loading, unloading, and stacking lumber generally worked in pairs, one at each end of the piece. In one depot a crew of women doing this work in the open were praised very highly by their foreman. He said they worked efficiently in bitter cold and in the hot sun. In the winter they climbed over high stacks of sleet-covered lumber without accident or complaint. He stated also that their absenteeism was not excessive, and that in a period of 7 or 8 months there were only two terminations from this crew. Two men working near by on a different job also praised these women. They said that though the women did not lift so much at one time as men, they worked steadily and well and by the end of the day had done as much work as men formerly employed.

A number of the loading jobs that women were performing required considerable exertion and endurance. In some of the depots Bureau agents were informed that these factors were given proper consideration when women were assigned to such work, but the Bureau's representatives considered some of these jobs too strenuous for women. On one of these women who loaded ammunition into boxcars by means of skids, had to control the movement, by pushing or holding back, of bombs weighing 250 pounds each. On some jobs they lifted at low and high levels packed ammunition and other supplies which seemed too heavy for women. Some women admitted that at times the work was strenuous, but in most cases they stated that they liked their job and were proud of their accomplishment.

Salvaging Jobs.—Boxes, crates, lumber, and other materials unfit for their original purpose or that have to be restored to usable condition are salvaged in depot operations. A considerable number of women were seen doing this work. Older women were working on these salvaging, loading, and stacking jobs, and some were praised as exceptionally good workers. Their work involved pulling nails out of lumber and boxes; scraping rust from steel dunnage and painting it with rust-prevention paint; cutting up and taking apart boxes and stacking the salvaged lumber.

Selectors, Identifiers, Inspectors.

In depots where loose-issue items are handled and where supplies are stored or issued in small quantities, hundreds and sometimes thousands of different articles have to be inspected, identified, and their storage location indicated when shipments are received, and must be located and selected when orders are filled. Employees who perform this work must be able to recognize and must know the names, the lots, and stock numbers, and the storage locations of great numbers of items. Women were doing some or all of this work in five depots that stored and issued automotive parts and tools, and Quartermaster, Engineering, Medical, Signal Corps, and Chemical Warfare supplies.

In some of these depots this work was subdivided among special crews who inspected, identified, selected, or replenished supplies. In others, all these functions were performed by the same person.

In one depot, for example, the women in the receiving section identified articles after crates were opened by boys. They also broke the shipments down to bin quantities and marked the lots for assignment to proper storage bins. In the same receiving room there was a special identification section, with a woman in charge, where articles were identified and storage space was assigned when the regular workers performing these tasks were in doubt about the supplies handled. A number of other women in this section were being trained for this work.

In another warehouse where small orders were filled, there was a special order-filling crew with a woman supervisor. This woman assigned the filling of orders to different girls who knew the location of the various items, picked and stacked them on hand trucks, and tagged them with the necessary information. In the "small-order" warehouse of this depot there was a special section for "outside" location of supplies stored in the "wholesale" warehouses. The woman in charge of this work was stationed in the small-order warehouse and had one woman assistant in each wholesale warehouse. These assistants knew the locations of and were able to identify materials needed to replenish stock in the small-order warehouse.

In another depot a number of these functions were combined. Women classified as "selectors" did spot-checking of materials when received, stacked them in broken-down-storage rooms, and also selected and checked items for filling individual orders. In some depots women who selected the stock apparently also performed packing operations. In a number of depots women who had supervisory storekeeping responsibilities were classified as "storekeepers."

Storekeepers.

Storekeepers in Government-operated depots are graded civil service employees with various responsibilities and degrees of authority. The duties of the storekeepers may include: Allocating space for incoming supplies; spotting, locating, and segregating outgoing stock; keeping records of stock on hand and available storage space; requisitioning supplies that fall below specified levels; and keeping storage sections and stock in order. Storekeepers may supervise the work of others or may themselves perform some of the work that falls within their jurisdiction. Storekeepers in the highest grades may be responsible primarily for over-all planning and contact with administrative officers and other depot branches and may delegate supervision of the actual work to assistant storekeepers.

Women storekeepers were employed in three depots, and in another a woman was being tried out as a storekeeper. In the depot that employed the largest number of women, several were working as storekeepers and were responsible for entire sections or divisions in warehouses. They allocated space, broke down lot shipments, filled bins or shelves, replenished stock by requisition, filled orders, maintained records of stock issued, and kept stock in an orderly state. Two women storekeepers in this depot were in charge of the handling and shipping of narcotics. In a section where medical supplies were handled and in the broken-down-package rooms, women did a combined job of storekeeping and packing. They picked stock for filling orders, prepared packing boxes or cartons, packed, checked, and re-

checked orders, and filled out forms listing the supplies in each package.

In 2 depots that issued many Quartermaster and Medical supplies in small quantities women who were classified as "selectors" were performing substantially the same type of work as women classified as "storekeepers."

All the depots that employed women as storekeepers handled some loose-issue items. Two also stored ammunition and explosives. No depot indicated that any woman doing this work was classified in the "senior storekeeper" grade.

Packing, Crating, Marking, and Stenciling.

The Army Service Forces stresses in one of its depot manuals that "Safe delivery begins in the packing room." Crating, packing, unpacking, and marking supplies make up one of the major subdivisions in depot work, especially in those depots where supplies are issued in broken lots.

Supplies that arrive in damaged containers, not strong enough for storing and reshipment; those that arrive in semipacked condition; those intended for overseas shipment, but not properly packed for that strain; loose-issue items and other supplies issued in small quantities; supplies that must be cleaned, repaired, or renovated—all these are packed, repacked, boxed, and crated at the depot. They are also stenciled or otherwise marked for identification in storage, at the point of use, and for shipment. Most of the packing work is simple, but it must be done properly or supplies will not reach their destination in perfect condition.

Women were employed on numerous packing and other closely related jobs in most of the depots visited. They crated and packed ammunition as well as other military supplies. In some depots, all or almost all the workers in a number of packing sections were women. Men and boys working in these sections generally performed the heavy tasks involving lifting and carrying supplies.

The packing work usually was organized on a continuous assembly-line basis, with each person performing a simple and relatively unskilled task. Conveyors were used in crating and packing ammunition and other heavy supplies; light loose-issue materials frequently were packed at tables, where in many cases the work was subdivided into several operations.

The jobs of women in these receiving, shipping, and packing sections involved the following: Bringing supplies or empty boxes to the packing lines; wrapping individual items and packages according to Army specifications; lining boxes with water-repellent paper; assembling into packing containers the required types and quantity of items; checking the contents; wrapping, closing, sealing, or nailing boxes, crates, and other containers; stenciling packed boxes or painting corners for export identification; staining boxes and crates; making handles for crates, nailing them on, and banding together as many as 12 large cartridge boxes, or wiring packed boxes and crates. Other work in packing sections on which women were engaged included packing cots, inspecting and sewing up bales of clothing and blankets, and weighing packed supplies.

The subdivision of work in sections where ammunition was crated on conveyors is fairly typical of that seen on other packing lines: Women, men, or boys brought crates to the packing lines and placed them on the conveyors; men put into the crates clover-leaf containers of ammunition; women standing along both sides of the conveyor inserted the crate tops, and in some depots other missing crate parts; other women nailed them down, using hand hammers. Women farther down the line stenciled the crates and men or women at the end of the line strapped the crates with strips of metal or wire. The packed crates were taken off the conveyors by men.

The work done by women varied, naturally, according to the supplies handled and the manner in which they were packed. In sections other than those described, women packers performed a number of additional tasks. In tool packing, for example, some women wiped the tools, some cut wrapping paper and tape, and some wrapped and sealed them. In other sections, where women were assembling tools into kits on conveyors, each woman was responsible for placing a specified number of certain tools in every kit as it moved down the line. Women on another conveyor sealed the bags in which the kits were placed and performed most of the crating operations.

In the sections where lighter-issue items were packed at tables, the work generally was subdivided in the same way. All the materials needed for packing were placed on racks near the packing tables within easy reach of the workers who used them. The supplies needed to fill each order were selected, placed on hand or motor trailer trucks, and brought to the packing lines by women or boys. Women and men at these tables performed all the packing operations.

There were further variations within and between depots in the subdivision of tasks and the extent to which women were used on suitable packing jobs. In some cases men and boys still were employed on packing jobs that women could do easily; in others they were assigned principally to those packing operations that were considered too heavy for women. Cases were observed also where women in packing sections were doing work that appeared to involve too much strain, while men and boys were on relatively light packing jobs that women could do and already were doing elsewhere.

In some depots, for example, boys and men were seen carrying empty boxes or crates to the packing lines, banding crates, and packing supplies that women could handle with ease, while in other places women were seen on such jobs as pulling or pushing packed crates that weighed close to 100 pounds (two women pulling each crate around the corner of the conveyor line); turning bales of clothing, which also weighed more than 100 pounds; and lifting heavy supplies to the packing conveyor.

In most depots no seats of any sort were provided for workers on packing lines, though seating seemed feasible on many of the jobs. Women's Bureau agents recommended the provision of seats on jobs where continuous or periodic sitting was possible, as a means of reducing the strain and increasing the efficiency of women workers.

Box, Crate, and Bag Making.

Most depots made the boxes, crates, bags, and some of the pallets used for packing and stacking supplies. Women worked on many

jobs in the sections where these supplies were produced. They unloaded and stacked lumber used for the boxes and crates; they assisted in operating and in some cases operated the electric rip and cross-cut saws used for cutting the lumber, some feeding the long pieces of lumber to the operators and guiding them into the saws, others taking off the cut pieces and stacking or assembling them. Some women put together the boxes and crates, on machines or by hand, using a wooden jig as a pattern; some examined the finished boxes and put them on a conveyor line; others performed various operations in which they used hand saws, planers, files, and other simple carpenters' tools.

In most box-making sections, only men operated the electric saws. In one depot, however, women operated Boice cranes and DeWalt and Delta circular ripsaws used in cutting lumber for boxes. Some women seen doing this work were handling continuously strip boards that weighed 15 pounds each. In another depot a woman was working on a DeWalt cut-off saw, and other women occasionally relieved the men who operated these saws. Here the ripsaws were considered too dangerous for women, and they were not allowed to operate them.

A great many women were making boxes by hand. Some were seen assembling very large boxes on which they had to use 16-penny nails and large hammers. Both men and women on this job were working continuously and rapidly.

Some women nailed boxes on nailing machines, two women to each machine—one holding the connecting pieces in place while the other used an electric foot press, driving the nails in. They stood on the approved type of floor boards, the shorter women having their boards raised a few inches from the floor.

Women were also making paper bags and waterproof linings for boxes. They worked at large tables where sheets of fibreen paper were measured, marked, and cut, and they folded, unfolded, pressed, and glued the bags.

In one depot women were spray-painting crates, and in another they were staining boxes on a conveyor especially equipped for this work. Carpet soaked in stain was wrapped around rollers on the conveyor so that the bottoms of boxes could be stained without women turning them over.

Specific information about box- and crate-making jobs was secured in nine depots. Two employed only men on this work; in three, on the other hand, from one-half to three-fourths of the workers in these sections were women. In some depots women, older men, and boys were performing substantially the same work, and, as before stated, in only two depots were women permitted to operate the power saws.

Women were praised as good boxmakers, and as experts at hand nailing of boxes.

Ammunition Inspectors.

One of the most highly skilled jobs in ordnance depots is that of the ammunition inspector. Ammunition inspectors must have a thorough knowledge of the safety regulations that apply to the handling and storing of high explosives and ammunition. Their duties may include inspecting and checking of the ammunition itself, the containers in which it is kept, and the magazines in which it is stored, renovated, or packed, as well as supervising less experienced inspectors.

Women ammunition inspectors were employed in three of the seven ordnance depots that stored ammunition and high explosives. In the largest of these, several women were already working as inspectors, others were being trained on the job and were to be sent away for additional training. The male inspectors still employed were to be sent to work at ports of embarkation. Three women inspectors were in the two other depots employing women.

Ammunition inspectors are graded civil service employees and their duties and the degree of responsibility and authority may vary according to the grade in which they are classified.

In the depot with the most women on these jobs, women inspected the ammunition igloos for dampness, ventilation, cleanliness, proper stacking of ammunition, and against overloading; they checked the doors, the door ventilators, and the drainage; they opened and inspected cars in which ammunition arrived. Sometimes they inspected the ammunition itself, and occasionally this work included taking shells and powder out of containers and refilling them. At times they watched the workers who loaded and unloaded ammunition to see whether the work was done safely and to teach safe handling methods. Some of the women also made up and packed boxes for less-than-carload shipments. The women inspectors who had worked at the depot longest arranged the office filing system in the ammunition area and trained other girls in the office to do the work. They also trained women to inventory igloos.

In another depot a girl who was employed as assistant ammunition inspector had to know how to handle ammunition and be able to determine when something went wrong with supplies in storage. The chief ammunition inspector in this depot stated that this girl was very satisfactory, that more women could be used for this type of work, but that it was difficult to find women with enough background to be trained for it.

The women doing this work had been given training on the job first and then sent for additional training to arsenals or other depots.

Checkers.

Checking incoming and outgoing supplies is a big job in most depots, as in all warehouses where stock is continuously coming in and being shipped out. In one of the depots visited, more than one-tenth of the workers were checkers.

Depot checkers have to verify the type and amount of supplies received, issued, or packed, and check such information as lot, stock number, contract number, weight, size of box, car and seal numbers, consignor and consignee, and so forth. Frequently they are required to observe whether boxes and crates are correctly stenciled or marked, whether packing containers are damaged, and make written or oral reports on conditions of shipments received. Some checkers in the depots visited also took inventory in the igloos and warehouses. In one depot women checking ammunition in the igloos also occasionally painted bottoms of shells.

The work of the checker is largely clerical, but depot checkers employed in the industrial sections are generally not office workers. They work wherever incoming or outgoing supplies are handled. At times they work in freight cars, checking supplies before they are unloaded; at times in the warehouses or ammunition igloos, in sheds or

on the open-air loading platforms and docks. Some checkers work in packing sections, checking items before they are packed for shipment; others work where incoming supplies are unpacked—checking items before they are distributed to designated storage sections or bins.

All 12 depots employed women checkers. In 6 of those reporting figures, all or almost all the checkers were women. Two employed close to 300 women checkers each; 2, close to 100 each; and the largest depot, where no figures on the number of checkers were secured, employed almost exclusively women for this work. In 9 depots from less than one-tenth to one-half of the women in the industrial sections were checkers.

In most of the depots that stored ammunition, women checkers were employed in those areas. They were also seen working in every area and section where supplies were loaded, unloaded, packed, or unpacked for storage or shipment. In the igloo area of one depot, women checkers worked out-of-doors in the winter when the temperature sometimes dropped to 20° below zero.

A few women checkers were reported in supervisory jobs or in the senior checker grades. In one depot a woman head checker supervised the work of 21 women who checked supplies in the ammunition area. In another a woman supervised 78 women checkers working in a warehouse section. One depot reported 10 women senior checkers and another 1 woman. In one depot, however, where almost 300 women and 100 men checkers were employed, the 34 workers listed as senior checkers were all men.

Repair, Renovation, and Assembly.

The maintenance of military supplies in a condition ready for use and issue involves a considerable amount of inspection, assembling, repair, and renovation work.

Women were doing some of this maintenance work in practically every ordnance depot visited, their occupations including the removing of rust, painting, and reassembling of loaded shells; dismantling and cleaning of automotive equipment; repairing of small arms or cannon; assembling of small-arms ammunition; and work in the optical-instrument repair sections.

Arms and Instrument Repair Jobs.—Women employed in the arms and cannon repair shops of one depot were machining, woodworking, cleaning, polishing, assembling, inspecting, and proof-firing firearms. In another depot a crew of women were employed on jobs that involved the use of electric drills and drill presses.

A number of depots that had instrument repair sections had trained or were training women for this work. Some of these young women (who had been given 4 months' training at an arsenal) were to take out, inspect, and repair lenses; regrease and repack instruments; and occasionally make parts that were damaged and could not be replaced.[7]

Ammunition Clipping Jobs.—Women employed in the small-arms clipping plant operated various types of machines on which ammunition was clipped or linked into rounds of 5 or 8 cartridges and into bandoleers of 105 rounds. Some operated link-belt, some clipping,

[7] Detailed descriptions of the work involved in these production jobs are contained in two Women's Bureau bulletins: Employment of Women in the Manufacture of Cannon and Small Arms in 1942—Bulletin No. 192–3, and Employment Of and Demand For Women Workers in the Manufacture of Instruments—Aircraft, Optical and Fire-Control, and Surgical and Dental—Bulletin No. 189–4.

and some metallic-link-belt machines. A few were working on hand-clipping machines. Others were inspecting the 105-round bandoleers; opening boxes of ammunition and clips and placing them on conveyors for the clipping line; packing assembled ammunition in metal-lined boxes; stenciling identification on crates and salvaging corrugated cardboard from incoming boxes. Hundreds of workers were employed in this shop and four-fifths of them were women.

Inspecting and Repacking Shells.—Three depots employed women in sections where shells were unpacked, the projectiles and cartridge cases taken apart, gaged or inspected visually, and repacked. In one depot where this work was exceptionally well organized, men were doing most of the heavy labor involved in unloading the clover-leaf containers in which the shells arrived, bringing the shells to the packing table, taking them off, and stacking them.

The inspecting, assembling, and repacking of the shells was done by women, who worked at large tables on a continuous assembly-line basis; women on one side handled the cartridge cases, those on the other the projectiles. A cardboard disk was placed over the open end of each cartridge case, on top of the powder bags. The fiber packing containers were placed in a horizontal position on the table; women on one side of the table inserted the cartridge case into one end of the packing container, and a woman on the other side inserted the projectile, fuze first, into the other end. The packed containers were then closed and taped shut by other women working along these tables.

One of these repacking jobs, which involved lifting momentarily, but continuously, 25-pound projectiles, seemed rather strenuous for women (even when they were rotated to other operations every hour), and Bureau representatives suggested the use of some mechanical lifting device for this operation.

Disassembling and Cleaning Automotive Equipment.—In one depot a small group of women were dismantling automotive equipment, cleaning bearings, distributors, and small parts in an oil solvent, painting parts with wax and oil as a rust preventive, and wrapping them in wax paper. This work was not heavy, but it was dirty and hard on the hands. In another depot where tools had to be cleaned of dirt and steel waste, old men and boys performed all the dipping and cleaning operations, and women cut paper and wrapped the tools.

Painting Shells.—In one depot a crew of men and women were seen removing rust with sandpaper and painting loaded shells. On this operation also men did the heavy work, such as lifting the shells, which weighed about 100 pounds, onto the tables and to the conveyors on which they were painted. Some of the men were engaged on the lighter work, such as scraping the rust off the shells.

Ammunition-Popping Jobs.—Two of the depots visited had ammunition-popping plants where components of used or deteriorated ammunition were salvaged. In one of these the plant was in operation but no women were employed in it. In the other, the plant was not in operation at time of visit but the Bureau agent estimated that women could be used in about 80 percent of the grading, pull-down, decoring, and inspection work.

Depot Operation and Depot Maintenance.

In practically all the depots visited women were employed on the depot guard forces, in the transportation sections, and in custodial

jobs such as janitress or matron. In three, women also worked as mechanic helpers in the depot maintenance shops, and in one women had been employed as firefighters.

Guards.—Women were employed as guards in most depots. The majority were performing gate duty—checking passes, admitting and escorting visitors. In two cases, women guards were classified as auxiliary military police; some also did patrol duty in the warehouse sections. In one of these they carried sidearms, and were reported to have done at least as well as men on the rifle range and in target practice.

In this depot women received about 1 month's training and practice, which included: Background orientation, theory, supervised patrolling, practice with firearms, first aid, safety, and military formality and courtesy. Future training here was to include jujitsu. These women had 20 minutes daily of drill and practice with firearms. About one-fifth of the guards were women and it was planned to increase the proportion to one-half.

In another depot, where almost one-fourth of the guards were women, they drilled with the men and they also were to be provided with firearms. Some of the women guards of other depots were radio operators, one was a teletype operator, and in one depot women guards were in charge of the property room, and cleaned and repaired guns and flashlights.

Dispatchers, Auto Mechanics, and Garage Attendants.—Practically all depots employed women as chauffeurs for driving passenger cars, carry-alls, station wagons, inter-area buses, and other passenger vehicles inside and outside depot grounds; in some cases only women were employed for this work. In a number of depots they were working also on other transportation and garage jobs. In three they were dispatchers of cars and trucks, and in one of these a woman was a senior dispatcher, a job involving a considerable degree of responsibility. It included the dispatching of transportation vehicles as well as the planning and scheduling of their use, and involved some supervision of men and women truck drivers.

In a number of depots women were working as mechanic-helpers in the car-repair sections. Most of them performed minor repairs. In one the women mechanics ground valves, tore down and cleaned out carburetors and distributors, put in rings, oiled and greased cars, and "got into everything," according to the foreman. Women were employed as garage attendants in three depots and this work included the usual duties of dispensing oil, testing tires, making minor repairs, and so forth.

Mechanic Helpers in Depot Maintenance.—In three depots several girls were working as mechanic helpers in the machine and electric shops. In one of these the girls sometimes operated lathes, tool grinders, drills, and drill presses; they worked under the close supervision of older experienced men who were all-round mechanics and this combination was considered a good one. Women in the electric shop recharged batteries, repaired and tested portable lights used in the depot at night, and repaired socket switches. In another depot the women did tractor repair work. Some of these girls had NYA training before they were employed and some were sent away to vocational schools after being hired; others were trained on the job. They were

praised as willing and intelligent workers and at least one girl had advanced to third-class mechanic.

Firefighters.—In 1 depot some 100 to 150 women had been trained as firefighters. Twenty-five women and 5 to 7 men usually were assigned to each shift. Administrative officers stated that women's work was satisfactory (though a coworker said that when they had a real fire they "got excited"). At the time of the visit no women firefighters were employed.

Matrons and Janitresses.—In several depots women were employed in these jobs and performed the usual custodial duties.

Supervisory Jobs.

In several depots a number of women were in supervisory jobs. They were employed as "foreladies," "supervisors," "gang bosses," or "crew leaders." One woman was listed as "assistant foreman of laborers," some were senior checkers, and one was a senior dispatcher.

Women gang bosses or crew leaders were in charge of small groups of workers, had only minor supervisory duties, and worked right along with their crews. Their main function apparently was to set the work pace.

A few women in supervisory jobs had wider functions and greater authority and supervised larger groups of workers. In one depot, for example, a woman was supervisor of 78 checkers. In another, several foreladies supervised the work of 400 women in a small-arms clipping plant. In general, however, even those who had wider functions worked under the direction of men supervisors, foremen, or subforemen.

Specific information about women in supervisory jobs was secured in eight depots. In at least two, the advisability of having women supervisors in all sections where women were working was fully recognized and there were some women in supervisory positions in every warehouse or section where women were employed.

In most instances women supervised only women, but in 2 cases women gang bosses were supervising both men and women. There were about 40 men and women in one crew crating ammunition, and 10 to 20 in another employed as laborers. In one depot, where only Negro and no white women were employed as laborers, some of the Negro women were squad leaders and gang leaders.

Personnel Relations Jobs.

Six of the depots visited employed women as counselors or in other personnel relations jobs. These included four of the five depots with the largest proportions of women in industrial operations. One depot that had a considerable number of Negro women workers employed a Negro woman counselor.

Reports on the duties and functions of these women were obtained in four depots, but in some the jobs still were "in the making" and not all functions were clearly defined. In all four, some of the women in personnel work checked or advised on the need of washroom and other depot facilities for women and handled problems relating to housing, child care, recreation, and other community facilities. In three, the counselors stated that they advised women crew leaders and other workers on job problems. In two, women in personnel relations gave exit interviews and some visited absentees.

Some of these women reported that they were studying the work of women on the jobs and advised or expected to make recommendations regarding working conditions and suitability of work.

Most of the women employed on these jobs had had no previous training in personnel relations work, but a number had had extensive experience in community work and other educational and practical experience which was useful background for their jobs. One woman who was chief of civilian personnel had had several years' office experience in that depot.

Clerical Work.

Depot storage operations involve a great deal of clerical work. At the beginning of 1943, three times as many persons were engaged on the paper and other overhead work of supply depots as were employed in the actual handling of matériel in and out of warehouses.

No effort was made by the Women's Bureau representatives to analyze office and other clerical occupations of women, principally because they were already employed in large numbers in most depot offices and their suitability for clerical work was recognized. However, some general information indicating how extensively they were used for office work was secured.

A large proportion of the women employed in the depots were working in offices or were doing clerical work in the industrial areas. In five depots where separate figures on office jobs were obtained, from 45 to 89 percent of the workers in offices were women. In six depots, from 24 to 68 percent of the total number of women employed were working in depot offices. In three of these, more than 50 percent of the women were in office jobs. However, one had just started operation and was only beginning to employ industrial workers; another was a wholesale establishment where most of the supplies handled were too heavy for women; and the third was in an area where men were still available for depot industrial work.

HIRING REQUIREMENTS, PLACEMENT, AND TRAINING

Proper consideration of age and physical condition in selection, job assignment, and induction and training were important factors in the efficient use of women on depot jobs.

Preplacement Physical Examinations.

Not all depots placed the right women in the right or the most suitable job, but many did use medical examinations as a basis for selecting younger and stronger women for jobs that required agility and considerable physical endurance and for placing older and less vigorous women on lighter jobs that did not involve too much physical exertion.

All depots visited required preemployment physical examinations. In a number it was indicated specifically that examinations were used as a basis for job placement. In two of these, workers were classified as to fitness for light, moderate, or arduous work. In one, the depot doctor advised as to the type of work on which an applicant should be placed. In another, workers were classified in three groups as (1) suitable for any work in the depot; (2) having a minor physical disability

but suitable for most types of work; and (3) suitable only for restricted work and placement, subject to approval of medical department. In this depot, workers in the third group and some in the second were given special cards indicating their physical disability, and when transferred from one job to another they had to show their cards to the foreman to secure exemption from work that was too heavy. In two other depots it was reported that physical examinations were required to determine fitness for a job. One depot also reported that in addition to the initial examination, periodic physical examinations were given during employment.

Pregnancy was not considered a physical disability in most of the five depots where information on this point was secured, but pregnant women generally were required either to bring statements from their own doctors or to report regularly to the depot doctors. In one depot it was stated that pregnant women were transferred to lighter work, and in another that they were kept on if in clerical jobs but not if on heavier work.

In 10 depots all physical examinations were made by depot doctors. In two, such examinations were required but workers had to employ their own doctors.

Policies Regarding Age and Marital Status.

Most depots had no hiring restrictions based on marital status. In a number of depots it was specifically stated that no distinction was made in hiring between married and single women and two reported that half and three-fourths, respectively, of the women workers were married.

No formal maximum hiring age was set in any of the depots where information on age policies was secured. A number, however, expressed preference for women between 25 and 40, and in one the actual age limit apparently was 50 years. The majority of women in industrial operations apparently were under 35. However, in several depots a considerable number of older women—over 40, and some 50, 60, and even as much as 70 years of age—were employed. The minimum hiring age was 18 years in all but three depots, two of which had a minimum of 16 years and one a minimum of 21.

Most of the depots were employing women 40 years of age or older. In one, the majority of the women were in the 40's and the average age of women in the warehouse area was 35. In another, 25 percent of the women were above 40 years of age and 50 percent were from 26 to 39. In a depot where no figures were available on age distribution, preference was expressed for women workers between 35 and 40 on the ground that they were more settled than younger women. One depot employed a considerable number of women who appeared to be in their 60's, and several others reported some women 50 and over in industrial sections.

In depots where the older women were placed on jobs that did not require too much physical exertion, they were apparently considered satisfactory workers. In a depot with many women 35 to 50 years of age they were on jobs that required but little lifting—doing such light work as bag-making, preserving and wrapping, stenciling and checking. In another depot a number of older women were employed in the small-arms plant on jobs requiring only moderate speed.

One of these women was 70 and claimed she could keep up with any worker in the plant. In two depots where a large proportion of women were reported to be over 40, many were employed as packers, checkers, and selectors.

In a number of depots older women were seen on jobs that required considerable physical exertion and appeared too strenuous for them. However, some of the older women seemed quite capable of handling any job to which they were assigned. In one depot, for example, many men and women in the late 60's were doing strictly laboring work and were considered very good workers. However, the white women in this area came from exceptionally healthy hard-working stock, were steady workers and used to heavy work. In one depot a grandmother was pointed out who, after working 10 hours a day on her depot job, put in 4 or 5 hours of work at home each day helping out in a small washing and ironing business run by her family. She looked to be about 60 years old, and stated that she traveled 97 miles to and from work.

Women of 40 or older were praised in a number of depots as hard and steady workers.

Training.

Depots have had to hire mostly inexperienced workers, and because of this some training and general orientation in depot operations and safety rules were essential even on the most unskilled jobs. Since most warehousing operations do not involve very much skill, the majority of the workers were trained on the job. A small number, who were on more skilled jobs, received supplementary training at the depots, and a few were sent for additional training to schools, arsenals, ordnance plants, or other depots.

All the women ammunition inspectors received some preliminary training on the job and were later sent for additional training to ordnance plants or other depots. Women who were to be employed to do optical-instrument repair work were sent to school, in some cases for 4 months' training before they were to begin work. In three depots women mechanic-learners had taken or were sent away for special training in Government vocational schools. Special training courses at the depots were also reported for women checkers, guards, or fork-lift-truck and tractor operators.

One depot had a dummy set-up for a full day's training of fork-lift operators, where empty cartons were used and workers were taught how to operate the trucks, pick up boxes, go in and out of doorways and so forth. Later these workers were given additional training on the job.

Most of the depots had the regular Job Instruction Training, Job Method Training, and Job Relations Training courses for supervisory personnel; and some reported that workers who trained others on the job were also required to take these courses. One depot reported that a JRT course was to be given to 200 women in 2 months' time to prepare them as group leaders and for supervisory jobs.

One depot reported a course in safety training. In several depots occasional instruction courses on safety were given, and practically all depots had refresher and other courses for clerical workers. All training was given on depot time.

One of the chief problems that depots faced was the lack of workers or supervisors to start with who knew how to train inexperienced workers. One of the depots solved this problem by establishing a temporary training school during the summer and staffing it with school teachers. These teachers started by working on the jobs themselves. After they learned the operations involved in each job, they worked out methods of teaching them to others and trained the more experienced workers how to teach inexperienced employees on the job. The courses included operation of fork-lift trucks and other vehicles, checking, nomenclature, stock-picking, stock-location, and safety and first-aid courses which some workers from each section had to take. There were also courses for guards and office workers.

In another depot the man in charge of the training department had several years' experience in vocational training and knew most of the crafts. He studied each job himself, made job break-downs, and then brought in the more experienced workers and showed them how to teach "green" employees.

This depot tried to overcome the shortage of adequately trained personnel by requiring all workers, from department heads to crew leaders, to take the JIT course for 1 week. Through this training the depot discovered a number of workers with supervisory capacities.

In most depots there was pressing need for more extensive Job Methods Training for supervisors, in order to acquaint them with methods that can be used to rearrange, simplify, and make less arduous and safer work on which women were or could be employed.

Only one depot had a training school that all new workers had to attend, after they were hired but before they went on the job. First a general orientation course was given to new workers, then special job training. The school had two or more classrooms, a library, a large room for movies, lectures, and so forth. A decrease in turnover among women workers was reported after this school began to function.

In a number of depots there was obvious need for additional training, even for unskilled workers, in the approved methods of lifting or carrying supplies, and for instruction in the proper use of such simple tools as hand hammers. In one it was reported that high rates of turnover among newer workers were due in part to lack of specific instructions relating to the job, as well as lack of general orientation on depot operations and functions.

ABSENTEEISM AND TURN-OVER; ACCIDENTS

Accident, absenteeism, and turn-over records are partial indicators of how adequately women function on their jobs. Statistics obtained in a few depots, and estimates of safety and supervisory personnel in others, indicate that in most depots women had at least as good a record as men.

Absenteeism.

Statements as to absenteeism were secured in 11 depots, but only 2 supplied statistics separately for men and for women. In the others the reports were based on depot records or on estimates of supervisory, administrative, or personnel officers,

Total absenteeism rates reported in a number of depots were surprisingly low and were said to differ only slightly as between the sexes. The lowest rates of unauthorized absenteeism reported by three depots ranged from 2 to 4½ percent. In one of these absenteeism was cut by more than one-half after a system of visiting absent workers was introduced.

Illness was given as the principal cause of absenteeism in four depots. Home and personal problems, shopping and transportation difficulties, were among the other principal reasons listed.

Turn-over.

Figures on total turn-over rates were secured in four depots. Only two of these had a break-down separate for men and women; in one, the turn-over rate was about the same for women as for men; in the other, the rate for men, excluding military separations, was 10 percent, and that for women was 3.5 percent.

In two other depots where no figures were obtained, administrative officers estimated that the turn-over rate was approximately the same for women as for men. In another it was stated that turn-over among women was very low. In one of these it was indicated that fewer women left their jobs after a depot training school was started where newly hired women were given some training and instructions after hiring but before going on the job. The reasons given by women for leaving their jobs included illness, home and other personal problems, inadequate housing, child care, transfer with soldier husband, "dissatisfaction," and accidents.

Accidents.

Accident statistics and reports of depot safety and administrative personnel indicate that women established a good safety record. In three of four depots where statistical data were secured the accident rates were considerably higher for men than for women; in one, women lost more time than men. Though higher accident rates among men are frequently due to more hazardous work, in a number of depots women doing the same work as men were considered safer and more careful workers.

The safety engineer of one depot, for example, in speaking about women fork-lift-truck operators and drivers of other motorized vehicles said, "Women are safer workers than men—much safer." In the same depot foremen expressed the opinion that women followed instructions more closely. In another, an administrative officer said he thought women were inclined to be more careful than men.

WAGES, HOURS, AND OTHER WORKING CONDITIONS

Wages.

The beginning minimum rates for women workers ranged from 46 cents to 72 cents an hour; in nine depots the beginners' rates were 50 cents an hour or more. Only one depot had a shift differential—5 cents for work after 6 p. m. Some of the civilian workers in the depot industrial areas were in graded Civil Service occupations, but many were in ungraded jobs and rates in these classifications were based

partly on the wage levels prevailing in the localities where the depots were operating.

Wage Advancement and Upgrading Policies.—In most depots wage advancement and upgrading standards were still in the formative stage. Only two of the nine establishments that reported on advancement policies had automatic systems based on length of service and on merit. One of these provided a 12-cent hourly increase in two steps within 90 days, another a 25-cent increase in 3 steps within six months. In six depots increases were based on merit and depended largely on the recommendation of supervisors. One depot reported that it had not yet established any system of promotion.

Reports from several depots indicate that for many women there had been practically no promotion from the lowest wage-rate classifications. This was due in part to the fact that some depots had not been functioning very long and most women were new workers, but this was not always the case; in some depots women who had been employed several months, and even women in supervisory jobs, still were getting beginners' rates.

Upgrading.—Most of the depots had no formal system of upgrading; three reported that promotional lines had not yet been established, or no regular system, and in two the only evidence of upgrading was the employment of some women as crew bosses, gang leaders, or foreladies. One depot reported that women were advanced by steps in job series and two reported regular Civil Service upgrading plans. In one depot it was stated that some women had been advanced from the laborers' group to higher-paying classifications and more skilled jobs.

Equal Pay.—Eight depots reported the same beginners' minimum rates for men and women. Three reported beginners' hourly rates for women that were 3 cents, 16 cents, and 18 cents less than those paid to men. One did not supply any information on rates for men.

All depots apparently conformed in theory to the equal-pay-for-equal-work standards affirmed by the National War Labor Board and the leading war production agencies of the Government. The Army Service Forces requires that job content and not the individual doing the work should be the determining factor in classifying ungraded civilian employees in Governmental installations. In keeping with this principle no pay differentials on the basis of sex were included in any depot job classifications; men and women in the same grade and job classifications had the same rates of pay. But most occupations had more than one grade or job rate, and a much larger proportion of women than of men were getting the minimum rates. For example, in the laborer groups, women were generally in the "light" labor classifications (which carried the lowest rates) on the ground that they did not or could not do heavy work. Men were generally in classifications that carried higher rates because, it was said, their work was heavier, required more endurance, experience, or skill.

Some cases were observed, however, where the wage differentials did not seem justified on the basis of actual work performed by men and women. In at least three depots, women who were getting the lowest rates were seen doing the same, as heavy, or heavier work than men and boys who were in higher wage classifications. Some of the lighter jobs on which women were employed required continuous application and some degree of skill and seemed productively at least

as valuable as the higher-paying heavier jobs of certain men and boys. Cases were reported also of women who replaced men being classified at a lower rate, notwithstanding the fact that they were employed to do the same work as the men. Though in conversation it was almost never admitted that a woman exactly replaced a man, since she cannot lift as heavy weights, in some cases women were praised as better workers than men in other respects. Wage differentials between women doing the same work were reported also.

In a number of depots, administrative officers were fully aware of the need of further study of some of the job classifications and the necessity of reclassifying some of the women workers.

Hours, Shifts, and Lunch and Rest Periods.

Scheduled Hours.—The standard work schedule in all but two depots was 8 hours a day, 48 hours a week, for each shift. Two depots operated on a 7½–45-hour schedule; in one of these the schedule in one section was 8–48 hours.

Shifts.—Seven of the 12 depots operated on a two- or three-shift basis and employed women on all shifts. In four depots the shifts were not rotated; in two they were rotated every 2 weeks; and in one every week. Five depots indicated the proportion of women employed on the second and third shifts; in four, from 10 to 50 percent of the women were on these late shifts, but in three of these two-thirds or more of the women were on the two earlier shifts. In one, an equal number of women were employed on each of the three shifts.

Overtime.—No figures were secured showing the actual amount of time worked by women over and above their scheduled hours, but other information was obtained indicating depot practices.

Ten depots reported on overtime. In 3, women were not required to work above scheduled hours. Four reported very little overtime for women; in 1 of these, it was stated that they occasionally worked on Sunday during emergencies; in another, men sometimes worked 16 hours in a stretch during rush periods, but women were not required to work these long shifts.

In the other three depots, considerable irregular overtime was indicated. In one, where it was limited to 3 hours a day, 6 days a week, the personnel officer stated that there had been "too much overtime" for women. In another depot, women sometimes worked up to 60 hours, on 7 days, a week. In a third, it was stated that women often worked on Sundays during emergencies and occasionally worked two or three extra hours daily.

Rest Periods.—Most depots allowed women two formal rest periods a day during working hours. Five reported two 10-minute paid rest periods for women on each shift, and three reported two 15-minute such periods. Some depots reported that they had no formal rest periods for most workers. In two depots women who worked in areas some distance from rest-room and toilet facilities had no formal rest period but were allowed more time for lunch, and some of this time was used for getting to the washrooms.

Lunch Period.—The lunch period in all but three depots was 30 minutes on all shifts. In two depots one hour was allowed for lunch, and one depot had 45 minutes for the first and second shifts but no formal lunch period for the third shift.

Working Conditions Surrounding Job.

Seats and Standing Platforms.—Most women in the depots' industrial sections were on active jobs where the use of seats was not feasible, but on many packing lines and on some of the other depot work where women were employed, seats could be used regularly or periodically. However, seats were rarely provided.

One depot, employing only a small proportion of women, had stools with backs for women on jobs where sitting was possible, and in some of the others seats were provided on table packing jobs. However, in three depots that had the largest proportions of women in industrial operations, proper seating provisions were practically nonexistent. One of these had ordered a small number of chairs and planned to experiment with them on various jobs. In another, women working in sections where seating was possible either had no seats of any sort or used boxes more often than chairs. In the third, no seats were observed in any section.

Bureau agents recommended the use of posture chairs on jobs where occasional or constant sitting was feasible, as a means of reducing strain and increasing the efficiency of women workers. They also suggested, in the interest of efficiency and the well-being of women, that it would be advisable to provide stools or benches with backs in sections where women who had to stand or move about constantly while working could sit and rest occasionally during periodic lulls in work.

Floor Boards.—Many depot jobs on which women were employed required continuous standing on cement floors, obviously very hard on the feet. In several depots floor boards or wooden platforms were provided for workers on these jobs, but in one depot none of the workers were supplied with such equipment.

Heating.—Because of the nature of supplies handled in ammunition areas and in ordnance warehouses, it is not considered safe to heat most of these structures. Therefore in the winter a large proportion of the women in the industrial sections worked in unheated warehouses and igloos or in the open.

Reports on heating provisions were obtained in five Ordnance, one Quartermaster, and one Medical depot. Four of the Ordnance depots had no heat in their warehouses, but provided some in rest rooms and other locations where women could go occasionally to get warm. One depot was considering the use of heaters on trucks. An Ordnance depot that handled primarily automotive equipment, and also the Quartermaster and Medical depots, had some provision for heat in most of the warehouses. However, since many of these structures were large and drafty, and their big doors frequently stood open for moving materials in and out, the heating was not always adequate, and Bureau representatives suggested that because of these factors it was especially important to provide well-heated and comfortable rest rooms for women.

Toilet and Washroom Facilities.—Inquiries were made or conditions were observed in most depots as to the provision of service facilities for women. There were sharp contrasts among the depots visited in the type and adequacy of toilets and washrooms. This was due in part to the large areas over which women workers were scattered in some depots, and in part to the fact that employment of

women in the industrial areas was not anticipated when certain depots were built and no special facilities for women were provided.

In six depots the toilet facilities apparently were adequate for all women workers. Such provisions were inadequate, however, in a number of depots, especially in the ammunition and other open areas. One depot had some wooden privies, and portable privies on skids were being built. One had some portable water closets. Under one primitive condition women in the ammunition areas were transported to toilets, only about one trip a day per woman being made and the round trip sometimes consuming 45 or 50 minutes.

The best toilet, restroom, and lunchroom facilities seen were in a depot where several women were employed in personnel relations jobs. This depot was built originally without facilities for women, but much ingenuity was shown in those constructed later. When visited, it had several large, airy, light, and cheerful restrooms, some of which had couches, lamps, magazines, cheerful decorative curtains, and linoleum on the floor. Toilets and washrooms were spacious, well equipped, and well kept. They had large mirrors, washbowls, paper towels, soap powder, an adequate number of toilets, sanitary supplies, and waste receptacles.

There were sufficient and neatly-constructed beaver-board lockers. There were large tables in the lunchrooms. The women in personnel relations jobs at this depot succeeded in getting shanty washrooms constructed even in the open areas. These shanties had benches and little tables; galvanized water pails for washing up and for drinking water; paper cups, paper towels, and washing powder. Apparently, most of these facilities were constructed largely with materials available at the depot.

In contrast to this was another depot that employed a large proportion of women and where originally there were no facilities for them. Here some of those built for men had been turned over to women and were extremely inadequate. In one section, for example, 200 women used facilities that were not adequate for more than 30 persons. In a warehouse of this depot, it was said that a sign on the only toilet available was changed at stated intervals to indicate when women or men could use it and some of the buildings in which women worked were one-fourth of a mile from the nearest toilet facilities.

In six depots where reports on rest rooms were secured, some such rooms were provided in every case, but generally they were inadequate and in only rare cases were cots or comfortable chairs provided in rest rooms. In the depots where information on lockers was secured, only two had sufficient for all women workers. In four others locker space was available only for some of the women. Five depots where reports on drinking facilities were obtained had some bubblers or fountains, but in a number they were either inadequate or not provided in the ammunition areas and other sections. Workers in some of the warehouse sections and in the ammunition areas were served by water trucks.

Safety Clothing.

Slacks, coveralls, bandanna, and safety shoes were the principal types of safety clothing worn by women in the industrial sections of the depots. For women in one depot who were on heavy laboring jobs and those who were driving tractors and trucks, the Government

provided, free of charge, very wide, ventilated leather belts that helped to support the back and kidneys. Goggles also were supplied when needed.

Safety shoes were required or recommended on many jobs, but few women were wearing them. None of the depots provided these shoes free of charge and only one had them for sale. Three depots reported difficulty in getting powder shoes or other safety footwear. In one of these, women were required to wear shoes without nails when they could not get powder shoes, but in some areas the flimsiest types were worn on jobs where sturdy shoes were needed. In two depots where women either could not get or did not want to buy safety shoes, they wore sensible low-heel walking shoes.

Slacks and coveralls were worn by most or all of the women in six depots. In a number of others, women who operated fork-lift and other trucks or tractors, women in machine shops, and those on other active jobs, wore overalls or slacks. Some of the older women seen were wearing dresses.

One depot engineer reported that face shields and goggles were provided for women on nailing jobs in the box-making departments to prevent eye injury from flying nails, but that most of the women did not wear them.

MEDICAL SERVICE; FOOD FACILITIES

Medical Service.

Most of the depots provided exceptionally good medical facilities. This was due in part to the hazards involved in handling ammunition and heavy supplies, but traditional Army medical standards unquestionably accounted in some measure for these high standards.

Most depots had hospitals, infirmaries, or extremely well-equipped first-aid provisions with nurses on duty constantly and doctors on duty or on call during working hours. In one notable case the first-aid building was equipped like a hospital, with operating table, a fine dispensary, and four or five rooms with a cot in each. One depot had, in addition to the hospital, seven first-aid stations throughout the area, with nurses in charge of each. One had a complete emergency hospital with a surgical room and four wards separate for men and women. Two others used post hospitals. Two had very good infirmaries with as many as five and eight nurses, respectively, on duty at all hours and several rooms for patients.

Depots that had no hospitals had well-equipped first-aid rooms or stations with full-time nurses and with doctors on duty all or part of the time.

First-aid kits must be and were provided, by law and under Ordnance regulations, in all sections where ammunition and explosives are handled. Workers who had received first-aid training were in charge of this equipment.

Food Facilities.

In depots that occupied many square miles it was difficult to provide adequate food facilities accessible to all workers. Even where transportation was available, it was not always possible to have stationary eating facilities that could be reached within a few minutes. This

applied especially to workers in ammunition areas who were scattered over hundreds of acres.

Eleven of the depots visited had one or more cafeterias, and one depot that was just getting into operation planned to provide cafeterias for the workers. However, in five depots it was reported that many workers could not or did not avail themselves of the cafeterias either because the facilities were too far from their sections or because the time consumed in standing in line was too long for workers who had only one-half an hour for lunch. Several depots reported that they staggered the lunch periods.

Some additional eating facilities were provided in a number of depots. One had two cafeteria stations from which food was sent out to workers in the more remote sections. Another had, in addition to cafeterias, a number of canteens, two had sandwich bars, one had a post exchange. In four, tables and chairs were provided in some of the sections for workers who brought their food with them. One depot had plans under way for a canteen service in distant areas.

In a number of depots the cafeterias were open for all shifts on which women were working. In two they were closed during one of the late shifts. In cases where the cafeteria closed at the end of the day, the workers occasionally required to stay overtime found it difficult or impossible to get food. Bureau representatives recommended that where cafeterias could not be kept open during late shifts, some canteen service should be provided, since hot food for workers on these late shifts is particularly important.

In practically all depots the cafeterias were Government-operated. In three depots where reports on quality were secured, hot meals were served and considerable variety as well as good quality of food was reported. In a depot in the South, workers were said to obtain a very adequate lunch for 25 cents. In a few depots it was indicated that there were no restrictions regarding the use of cafeterias by office and industrial workers nor by white and Negro workers. Privately operated cafeterias were visited in two depots, and in both of these the service and the quality and variety of food were very poor.

Since in some depots it was almost impossible to provide cafeterias accessible to all workers, Bureau representatives recommended more extensive use of canteen service as a means of getting warm food to workers in the outlying areas. They also recommended more adequate provision of lunchrooms with tables and chairs where workers who brought their food from home could eat in comfort.

HOUSING; RECREATION FACILITIES; TRANSPORTATION

Housing.

The provision of adequate housing for depot workers was an important factor in securing and maintaining a stable labor force. A number of depots were in isolated areas where special housing had to be provided for some of the workers, and a number were in or near communities where serious housing shortages existed. In some of these it was practically impossible to secure any family units. Single rooms, when available, seemed reasonably priced, but not infrequently it was reported that single women living in rented rooms were allowed no home privileges of any sort. Partly due to lack of nearby housing

facilities, some workers traveled 100 miles or more each day to and from work, the bus fares in such cases amounting to 80 or 85 cents a day.

Information on housing provisions was secured in a few depots. In 5, special FHA projects for depot workers had been built or were in process of building. One depot was in a community where the FHA was putting up 1,000 temporary housing units. In 2 other depots, which as yet provided no special housing for their workers, the personnel departments helped the workers with their housing problems. Some workers lived in auto trailers.

Two of the four depots where special housing was provided for the workers had dormitories and apartments for men, women, and married couples. One had dormitories for single men and women, and in one case several dormitories originally intended for men were assigned to women.

Most of the rooms in these housing projects were furnished with such basic essentials as a bed, bed linen, a chair, a dressing table, a mirror, and an open closet or closed wardrobe. In one housing project it was reported that daily maid service was provided, and two others planned such service. All women's dormitories had adequate bathroom and toilet facilities. Well-equipped laundries were available in three depots; and in one where the dormitories were originally intended for men, laundry equipment was to be installed. Three projects had centrally located cafeterias.

One housing project planned to have an infirmary with nursing service, which was to include an isolation room with four beds for contagious diseases and another with four beds for general illness. It was planned to provide tray service for those ill in the infirmary. In all five housing projects, rooms, dormitories, or special halls were set aside or planned for recreation purposes.

Rents were reasonable in all dormitories. The usual rent for a single room was $15 a month; for a double room it was $10 a month per person. In one case the rent was even lower: In a double room it was $8 a month per person and in rooms accommodating three or more, it was only $6 per person. However, the rooms in one dormitory with higher rents were extremely bleak and barrack-like, were not adequately equipped, and would not be considered desirable living quarters by most women. No drawers of any kind were provided, the closets were without doors, the construction was rough, the floors were rough, and no floor covering or spreads were provided. Administrative officers were aware of the fact that women could not be satisfied with such bleak rooms, and were trying to secure additional furniture and to make them more livable.

Recreation Facilities.

Provision of recreation facilities for workers who did not normally live in the depot areas and for those who lived in depot housing projects also was an important personnel problem. One of the women in employment personnel relations stated that her depot frequently lost good workers because they got so bored living in the little nearby community with nothing to do after their working hours.

Information about recreation activities was secured in a number of depots. All four that had special housing projects for their workers provided some such facilities.

One of the housing projects had a special officer in charge of recreation activities and one of the dormitories was fitted up as a recreation building. A large room on the ground floor of this building had equipment for ping-pong and other games, as well as a piano, radio, and well-stocked bookshelves. On another floor there were a large recreation room for special use and four small reading rooms. Each Wednesday there were dancing and bingo games.

A depot where women had just begun to move into the dormitories reported plans for an extensive recreation program. This depot had three recreation halls and planned to build a small reception building near the gates, where women could meet their friends. It had a picnic area with trees and grass, where there were to be fireplaces for outdoor cooking. Its planned recreation program included dances, athletics, various outdoor activities, and classes if desired. A motion-picture theater was being built near the housing project.

A depot that was at some distance from any center of population and expected to have a large proportion of its workers live in the depot dormitories and apartments, was planning several small recreation halls for women. Community facilities, when the housing project was completed, were to include a playground, motion-picture house, a recreation center, a beauty shop, markets, a cafeteria, a school, and a nursery for young children.

Transportation.

Because of the isolated location of some depots, and the wide areas from which workers were recruited, special transportation provision had to be made.

The majority had regular bus service only at shift hours. Five were served by public buses, street cars, and private cars. One of these had an arrangement with an outside bus company that furnished transportation to workers from surrounding areas. Three depots provided special bus service for workers who lived in nearby towns. One other was arranging with a private company to furnish transportation at reduced rates (company to receive a subsidy from the Government) for workers who lived about 40 miles from the depot.

Many workers made car-pooling arrangements and commuted daily in private cars. This was the only form of transportation available to some workers who lived in towns within the recruiting area of depots.

One depot provided special buses and carry-alls in cases of emergency and for transporting workers on night shifts and those working overtime. It also had a special clerk to handle transportation problems of workers. Another had a special rationing board at the depot for rationing gas. In two or more depots, women in personnel jobs advised in the transportation problems of women.

Car break-downs and lack of facilities for repair, lack of garage service, and overcrowded and infrequent bus service were serious problems in a number of depots. In one it was reported that residents in nearby towns preferred work elsewhere rather than using the poor bus service to the depot. In many instances, transportation difficulties were among the chief causes of absenteeism and turn-over.

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UNITED STATES DEPARTMENT OF LABOR
FRANCES PERKINS, SECRETARY
WOMEN'S BUREAU
MARY ANDERSON, DIRECTOR

✦

Women Workers in Some Expanding Wartime Industries

New Jersey, 1942

BULLETIN OF THE WOMEN'S BUREAU, No. 197

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LETTER OF TRANSMITTAL

UNITED STATES DEPARTMENT OF LABOR,
WOMEN'S BUREAU,
Washington, June 4, 1943.

MADAM: I have the honor to transmit a report of the first survey of war's effect on women and women's employment in a cross section of war industries ranging from the manufacture of wool and clothing to the manufacture of explosives and technical instruments. While the survey covers industries in one State, it reflects the changes taking place throughout industry and the effect of good and poor conditions of employment and personnel policies on the morale of women war workers.

During the course of this survey employers were kept informed of conditions found and cooperation in securing corrections was excellent.

The field survey was under the direction of Caroline Manning and the report was written by Dorothy K. Newman and Miss Manning. Margaret Mettert prepared the summary of hazards.

Respectfully submitted.

MARY ANDERSON, *Director.*

HON. FRANCES PERKINS,
Secretary of Labor.

CONSTRUCTIVE IMPORTANCE OF THE SURVEY

The New Jersey survey here reported was made in the summer of 1942, when firms were experiencing the throes of tremendous expansion to meet the pressure for war production. At that time a few companies had not devoted much thought or effort to the plant conditions that contribute to human efficiency. Since then there has been great improvement in these matters, as evidenced by the following excerpts from letters of employers to the Women's Bureau.

These tell of new buildings occupied, of specific conditions remedied, and of a general understanding of the importance of human satisfactions in a successful prosecution of the war.

> You may be interested to know that our new building is in partial operation and we expect to have it in full operation within the very near future.
>
> I am glad to report that our new enlarged hospital-room facilities have been taken care of and have been in use for some time now. Other alterations and extensions under construction and revamping when you were here have also been completed.
>
> A survey of our lunch-wagon service is being made, the results of which will be analyzed and corrective measures taken to insure improvement along these lines.
>
> You may be assured that we are correcting the crowded toilet conditions as rapidly as possible.
>
> The pressure of the war program prevents our complying with many excellent ideas as promptly as we would like, but I am sure you will be glad to know that we are carrying through with the matron suggestion beginning next week.
>
> Most of the unsatisfactory conditions reported have already been corrected.
>
> You will be interested to know that we are going to carry out the constructive suggestions to the best of our ability.
>
> You gave us several very constructive suggestions and it has been a pleasure on our part to follow these instructions. On another visit you will find a marked improvement in the handling of the matters that were brought to our attention.

WOMEN WORKERS IN SOME EXPANDING WARTIME INDUSTRIES—NEW JERSEY, 1942

I. SCOPE AND CHARACTER OF THE SURVEY

Army uniforms, communication equipment, chemicals—in fact, myriads of manufactured products—go into battle just as do planes, guns, bombs, and tanks. Many other articles play an essential part behind the lines. Every branch of American industry is contributing directly or indirectly to the war effort either through the continued manufacture of all or part of its peacetime products or by conversion of plant to meet special war needs.

With this in mind the Women's Bureau in the summer of 1942 undertook a survey of women workers in a cross section of industries represented by 137 plants devoting 50 percent or more of their production to war-contract work. All are in New Jersey, and well over half are engaged in war work alone. One of the most highly industrialized and economically diversified States in the country, New Jersey holds fifth place in the employment of women in factories. Woman-employing industries that are especially important there, such as apparel manufacture and the production of electrical equipment and machinery, are now using women in increasing numbers, while industries ordinarily chiefly male-employing are taking women on in jobs they have never before filled. This is in response to the need for meeting war contracts that by June of 1942 amounted in New Jersey to well over four billion dollars, and meeting them in a labor market that is fast losing available male reserves. The New Jersey situation, besides being vital in itself, reflects the important changes that are occurring in industrial employment throughout the country.

The majority of the plants visited had reached volume production before Pearl Harbor and many were manufacturing war materials in considerable quantity even before the fall of 1940, a year after the war began in Europe. Four of the factories were built expressly for war work and in all but 21 of the rest major adjustments had been made in plant or machinery. Most adaptations of plant facilities consisted in the introduction of new machinery or equipment, the addition of a new building or buildings to existing structures, the accession of floor space or full utilization of heretofore idle floor space.

Physical conversions in plant were only occasionally the result of important changes in process requiring different machinery and extensive change-over in technique. Actually, only one in six of the firms visited, more than half of them in ordnance manufacture alone, are now producing materials substantially different from those made before the war.

The plants visited reported the employment in the summer of 1942 of 233,014 workers, 68,607 of them, or nearly 3 in 10, being women. They fall into 14 main industrial classes, as listed in table 1, ranging all the way from the usual civilian activities of textile and apparel manufacture to the production of ammunition, gun parts, and other ordnance accessories.

TABLE 1.—*Number of plants visited, number of persons they employed, and number of home visits made by Women's Bureau agents, by industry*

Industry	Plant survey				Home visits	
	Number of plants visited	Employees			Number of plants represented	Number of home visits
		Total number	Women			
			Number	Percent of total [1]		
All industries	137	233,014	68,607	29.4	138	696
Aircraft engines and propellers	3	37,086	3,314	8.9	2	10
Ammunition, gun parts, and other ordnance accessories	15	21,538	5,544	25.7	14	54
Apparel and other fabricated textile products	27	7,913	5,451	68.9	31	156
Chemicals and drugs	5	9,243	1,296	14.0	5	21
Electrical products	37	79,506	30,654	38.6	36	197
Communication equipment	18	56,232	26,034	46.3	18	121
Motors, generators, and other electrical products	10	10,768	3,217	29.9	10	46
Wire and cable	9	12,506	1,403	11.2	8	30
Instruments, professional, scientific, and other	9	22,196	7,483	33.7	9	36
Machines and machine tools	4	4,664	815	17.5	5	26
Metal parts, small	9	12,298	2,030	16.5	7	29
Plastic products	3	2,252	572	25.4	3	17
Rubber products	4	7,432	1,231	16.6	3	15
Textile-mill products	8	13,702	6,988	51.0	9	82
Miscellaneous	13	15,184	3,229	21.3	14	53

[1] Percent of women in these industries, especially aircraft engines and propellers, has increased materially between date of survey and that of publication.

The men in the surveyed firms were productive workers in somewhat larger proportions than the women, though even among the latter only 16 percent worked in the office as compared with 84 percent employed in the factory. In the separate industries the proportions in factory and office varied widely. For example, nearly a third of the women in chemicals and drugs, nearly two-fifths in machines and machine tools, and well over two-fifths in the aircraft engine and propeller firms surveyed were office force. On the other hand, almost all the women in clothing plants and textile mills were factory workers. In only four industries were over 10 percent of the men in the office: in the communication-equipment firms, more than 20 percent were office personnel, exceeding even the proportion of women in the office.

To supplement the industry investigation, 696 women workers in 138 factories (most of the plants identical with the 137 surveyed) were visited in their homes. Information was secured from these women concerning conditions outside the plant that influence their effectiveness as employees; for instance, the extent of their household duties and the way in which they provide for their children's care during working hours. Insight was secured also into their attitudes toward such job conditions as night work, overtime, rotation of shifts, the

TABLE 2.—*Employment of women and of men in factory and office, by industry*

Industry	Total number of plants	Total number of employees	Women					Men				
			Total number	In factory		In office		Total number	In factory		In office	
				Number	Percent	Number	Percent		Number	Percent	Number	Percent
All industries	137	233,014	68,607	57,717	84.1	10,890	15.9	164,407	143,769	87.4	20,638	12.6
Aircraft engines and propellers	3	37,086	3,314	1,812	54.7	1,502	45.3	33,772	28,043	83.0	5,729	17.0
Ammunition, gun parts, and other ordnance accessories	15	21,538	5,544	4,806	86.7	738	13.3	15,994	14,638	91.5	1,356	8.5
Apparel and other fabricated textile products	27	7,913	5,451	5,323	97.7	128	2.3	2,462	2,372	96.3	90	3.7
Chemicals and drugs	5	9,243	1,296	870	67.1	426	32.9	7,947	7,377	92.8	570	7.2
Electrical products	37	79,506	30,654	25,697	83.8	4,957	16.2	48,852	41,160	84.3	7,692	15.7
Communication equipment	18	56,232	26,034	21,931	84.2	4,103	15.8	30,198	23,585	78.1	6,613	21.9
Motors, generators, and other electrical products	10	10,768	3,217	2,799	87.0	418	13.0	7,551	7,068	93.6	483	6.4
Wire and cable	9	12,506	1,403	967	68.9	436	31.1	11,103	10,507	94.6	596	5.4
Instruments, professional, scientific, and other	9	22,196	7,483	6,545	87.5	938	12.5	14,713	13,366	90.8	1,347	9.2
Machines and machine tools	4	4,664	815	501	61.5	314	38.5	3,849	3,316	86.2	533	13.8
Metal parts, small	9	12,298	2,030	1,447	71.2	583	28.7	10,268	9,131	89.0	1,137	11.1
Plastic products	3	2,252	572	454	79.4	118	20.6	1,680	1,565	93.2	115	6.8
Rubber products	4	7,432	1,231	909	73.8	322	26.2	6,201	5,641	91.0	560	9.0
Textile-mill products	8	13,702	6,988	6,703	95.9	285	4.1	6,714	6,400	95.3	314	4.7
Miscellaneous	13	15,184	3,229	2,650	82.1	579	17.9	11,955	10,760	90.0	1,195	10.0

lunch period, and the like. The pre-war employment status of these women was obtained, that some light might be shed on the extent of in-migration among women and the source of the expanding woman war labor force in the area.

Employers, especially those hiring women for the first time, were eager for suggestions on specific situations in their own factories. Repeatedly during the plant visits the conversation turned to occupations suitable for women, not only those on which they were already employed or had replaced men, but occupations that offered possibilities of expanding the employment of women. In more than 50 plants jobs were indicated in which women had worked with success elsewhere and in which their employment had already passed the experimental stages.

The following is a summary of topics on which special recommendations with regard to conditions seemed called for and were made:

	Number of plants
Night work; rotation of shifts; hours in general	56
Lunch periods; rest periods	46
Aisles, stairs	19
Ventilation	11
Safety	20
Safety clothing	15
Seats	20
Job strains	19
Service facilities:	
Wash rooms	38
Lunch and food facilities	29
Rest rooms	27
Matrons	10
Drinking fountains	6

II. EFFECT ON WOMEN'S EMPLOYMENT OF THE SHIFT FROM PEACETIME TO WARTIME PRODUCTION

Changes in the number and proportion of women.

Industrial employment in New Jersey has increased by well over one-half (53 percent) since the beginning of 1940. Women account for an estimated two-fifths of the increase, with approximately 115,000 additional workers up to early in 1943. Some industries, such as automobile, apparel, and textile manufacture, lost personnel, while four industry groups—transportation other than automobile but including aircraft, electrical, machinery, and chemical—absorbed nearly nine-tenths of the new workers. All four of these groups are represented in the Women's Bureau sample.

Firms primarily engaged in war work, such as those covered in this survey, would be expected to show more than the average increase in employment. This is actually the case and to a marked degree. With the use of employment figures published in the Industrial Directory of New Jersey of 1940–41, it has been been possible to estimate the proportion of increase in employment of women and of men between 1940 and the summer of 1942 in 128 identical plants. Total employment in these plants increased in this period by as much as 88 percent, women's employment alone by more than 100 percent. Most of the increase in women's numbers, as distinct from the percent of increase, occurred in communication equipment, instruments, ordnance, aircraft engines and propellers, and apparel, in that order. The rise in total women employed in the communication-equipment industry accounted for two-fifths of the entire increase of women in the sample. Though the numbers involved in chemicals and drugs and in the manufacture of small metal parts are not great, it is nevertheless significant that the percentage increases among the women employed there are exceeded only by that in aircraft engines and propellers. These are, all three, industries in which women have made amazing inroads since 1940. Women grinding- and milling-machine operators; store-room clerks; foreladies; and lathe, drill-press, and bench machine workers, show especially marked proportions of increase. Women assemblers, inspectors, and miscellaneous hand workers on process, however, have made the largest net gain in numbers.

Twenty-two of the 137 plants visited are employing women for the first time because of the war emergency. These 22 plants, representing fewer than a dozen industries, alone account for the recent employment of more than 6,000 women in New Jersey.

Though women are making great strides, men continue to predominate in numbers. For example, the men show a net gain in the sample plants more than twice that of women, though their proportion of increase is lower. In aircraft engines and propellers and com-

TABLE 3.—*Percent of increase from 1940 to summer of 1942 [1] in numbers employed by 128 identical plants holding war contracts, by industry*

Industry	Number of plants	Percent of increase in numbers employed		
		Total	Women	Men
All industries	128	87.8	101.6	82.7
Aircraft engines and propellers	3	171.7	427.7	159.3
Ammunition, gun parts, and other ordnance accessories	15	98.6	146.3	86.1
Apparel and other fabricated textile products	22	77.9	103.[2]	40.9
Chemicals and drugs	5	85.1	195.9	74.4
Electrical products	37	86.8	111.2	74.2
Communication equipment	18	107.9	114.0	102.9
Motors, generators, and other electrical products	10	137.8	142.8	135.7
Wire and cable	9	13.9	36.5	11.6
Instruments, professional, scientific, and other	9	100.2	146.0	82.9
Machines and machine tools	3	61.8	55.9	62.9
Metal parts, small	6	105.0	166.1	96.8
Plastic products	3	7.9	38.2	.4
Rubber products	4	30.3	72.2	24.3
Textile-mill products	8	6.5	7.3	5.7
Miscellaneous	13	118.9	111.7	120.9

[1] Figures for 1940 are from the Industrial Directory of New Jersey, 1940–41, compiled by New Jersey Bureau of Statistics and Records, State Department of Labor, Trenton, N. J. Figures are for the average number of employees, adults and minors. For numbers in plants in summer of 1942 figures are those secured by Women's Bureau agents from plant officials.

munication equipment alone, the additional men employed since 1940 number more than the increase in all women together. The percent of gain among the men is greatest in aircraft engines and propellers and in the manufacture of motors, generators, and miscellaneous electrical products.

In spite of their expanding number, men's proportional importance in the firms visited has been declining; in fact, the ratio of women to

TABLE 4.—*Proportion of women in 128 identical plants holding war contracts, 1940 and summer of 1942,[1] by industry*

Industry	Number of plants	Percentage of women among total employees		
		In 1940	In summer of 1942	Increase (number of points)
All industries	128	27.3	29.3	2.0
Aircraft engines and propellers	3	4.6	8.9	4.3
Ammunition, gun parts, and other ordnance accessories	15	20.8	25.7	4.9
Apparel and other fabricated textile products	22	59.6	68.0	8.4
Chemicals and drugs	5	8.8	14.0	5.2
Electrical products	37	34.1	38.6	4.5
Communication equipment	18	45.0	46.3	1.3
Motors, generators, and other electrical products	10	29.3	29.9	.6
Wire and cable	9	9.4	11.2	1.8
Instruments, professional, scientific, and other	9	27.4	33.7	6.3
Machines and machine tools	3	15.6	15.0	[2].6
Metal parts, small	6	11.8	15.4	3.6
Plastic products	3	19.8	25.4	5.6
Rubber products	4	12.5	16.6	4.1
Textile-mill products	8	50.6	51.0	.4
Miscellaneous	13	22.0	21.3	[2].7

[1] Figures for 1940 are from Industrial Directory of New Jersey, 1940–41, compiled by New Jersey Bureau of Statistics and Records, State Department of Labor, Trenton. Figures are for the average number of employees, adults and minors. For numbers in plants in summer of 1942 figures are those secured by Women's Bureau agents from plant officials.

[2] In this case there was a decrease.

total personnel has increased within the last 2 years in almost every industry group represented. The ratio change has been especially marked in the apparel, instrument, plastic, and chemical firms visited. This trend shows direct and effective adjustment to a male labor shortage that is fast becoming acute.

Women as replacements for men.

By June of 1942, the date of survey, more than 1 in every 9 of the factory women for whom data were available were holding jobs ordinarily filled by men. If the largely woman-employing textile and apparel industries are excluded, the ratio becomes approximately 1 in every 7. Almost half the women in men's occupations are in aircraft engine and propeller firms and electrical plants; yet these 2 industries are very different in the matter of women's employment. The electrical industry is long established and traditionally woman-employing. It is hiring even more women today and in addition is substituting women for men in many jobs. This is to be expected in an industry that is accustomed to women in productive work, unlike the manufacture of aircraft engines and propellers, a comparatively new venture and known previous to this war as an almost exclusively male-employing enterprise. All women working for the three important aircraft engine and propeller firms surveyed are replacing men. In contrast, only 7 in every 100 women in the electrical plants are substitutes; most of the others are in occupations that have always been women's.

Women are in men's jobs to the extent of well over two-fifths of their total in the chemical and drug plants visited, one-third in the machine and machine-tool factories, and considerably more than a fourth in those making small metal parts. The extensive conversion necessary to change over from civilian production affected considerably the occupational alinement in the ordnance plants surveyed, and in 1942 more than twice as many women were employed on jobs entirely new to the establishment as were on jobs formerly held by men. Industrial conversion accounted also for the fact that, except for aircraft engines and propellers, ordnance showed the smallest proportion of women of all the industries covered in jobs women held before the war.

Though the management may be unaccustomed to employing women, and in some cases may have resisted such action, it is interesting that women in the factories visited tended to comprise a substantial proportion of the personnel in productive occupations that ordinarily are men's domain. Except in airplane engine and propeller manufacture, where the ratio was only 1 woman to 10 men, the ratio was never so low as 2 to 10, and in rubber products reached well over 15 to 10. In machine and machine-tool production and in ordnance manufacture, women were half of the personnel in factory jobs where substitution had been made.

Women's occupational distribution.

Almost no discernible change had occurred in the occupations of women in textile and apparel manufacture, in which women have for a long time played an important part. For this reason these industries are excluded from further occupational discussion and analysis.

TABLE 5.—*Distribution of women productive workers according to occupational status, by industry*

Industry	Total number of plants	Total number of women	Women's employment in—						
			Pre-war occupations		Occupations new to plant		Occupations formerly performed by men only, now performed by men and women		
			Number of plants	Percent of women	Number of plants	Percent of women	Number of plants	Percent of women	Percent women are of total employees in these occupations [1]
All industries [2]	93	35,187	75	79.3	26	5.4	67	15.3	17.5
Aircraft engines and propellers	3	1,450					3	100.0	9.1
Ammunition, gun parts, and other ordnance accessories	11	3,387	9	41.2	5	41.5	7	17.4	49.1
Chemicals and drugs	5	584	3	54.1	1	3.9	4	42.0	30.0
Electrical products	34	18,353	32	91.5	10	1.9	24	6.6	22.9
Instruments, professional, scientific, and other	9	6,003	9	88.7	1	.1	6	11.2	18.5
Machines and machine tools	4	510	2	52.4	2	14.5	3	33.1	49.7
Metal parts, small	9	1,569	6	71.5	1	.4	8	28.1	37.4
Plastic products	3	420	3	96.2	3	1.7	1	2.1	[3]
Rubber products	4	851	4	85.5	1	.1	3	14.3	63.5
Miscellaneous	11	2,060	7	75.6	2	1.3	8	23.1	72.9

[1] Based on reports from 51 of the 67 plants.
[2] Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.
[3] Not computed; base too small.

TABLE 6.—*Employment of women in their pre-war occupations, in occupations new to the plant, and in occupations previously performed only by men*

Occupation	Total number of plants	Total number of women	Women's employment in—						
			Pre-war occupations		Occupations new to plant		Occupations formerly performed by men only, now performed by men and women		
			Number of plants	Percent of women	Number of plants	Percent of women	Number of plants	Percent of women	Percent women are of total employees in these occupations [1]
All occupations	[2] 98	31,145	75	77.8	26	5.4	67	16.8	17.8
Assembler	58	11,122	42	92.1	5	1.7	21	6.2	25.0
Bench worker, hand	26	552	17	54.8	4	13.0	11	32.2	32.6
Bench worker, machine	33	824	13	56.0	6	11.8	21	32.2	8.2
Draftsman and tracer	6	17	1	5.9			5	94.1	47.4
Drill-press operator	46	1,195	17	40.5	5	5.4	27	54.1	17.3
Forelady	7	72	5	51.4			2	48.6	77.8
Gear-cutting-machine operator	2	21					2	100.0	1.3
Grinding-and-polishing-machine operator, optical glass	2	49					2	100.0	31.2
Grinding-machine operator	15	389	3	8.7			12	91.3	9.0
Hand worker n. e. c.	46	2,378	37	74.9	5	15.8	18	9.3	16.2
Inspector	66	5,176	48	74.0	9	11.2	24	14.8	25.6
Job setter	1	148	1	100.0					
Lathe and screw-machine operator	21	428	3	25.2	2	4.9	16	69.9	11.0
Machine operator n. e. c., in electrical products	17	1,291	14	87.4	1	.2	8	12.4	27.3
Machine operator n. e. c.	42	1,469	26	78.1	5	1.8	21	20.1	33.2
Milling-machine operator	13	210	3	6.7	1	1.0	9	92.3	11.0
Packer and wrapper	35	1,308	25	73.8	3	2.7	11	23.5	42.1
Painter	17	322	10	63.6	2	16.5	7	19.9	20.8
Punch- and forming-press operator	38	1,305	25	68.9	2	12.2	15	18.9	29.1
Service and maintenance worker	14	348	7	48.3	2	1.7	7	50.0	35.1
Solderer	14	853	12	96.2	1	.4	2	2.4	100.0
Storeroom clerk	9	71	2	4.2			7	95.8	30.5
Tool-crib attendant	7	58					7	100.0	20.5
Welder	8	89	7	97.8			1	2.2	33.3
Winder, coil and armature	17	1,450	17	93.6	2	.5	7	5.9	60.2

[1] Based on reports from 51 of the 67 plants.

[2] Details exceed totals, as plants report on more than one occupation. Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.

When the specific occupations were examined in which women were being employed as replacements in the other industries, some very interesting facts were brought to light. It became evident, for example, that the new occupations for women varied from factory to factory. Actually there were few types of jobs in which women were being substituted for men in some plants that they were not regularly holding before the war in other plants. Only 4 in a group of about 25 factory occupations in which women were employed at time of survey were not represented among those that women held in one or more establishments before the war. And, likewise, except for the job setters in one large electrical firm, each and every one of the 25 jobs was named somewhere in the sample as one that women were filling for the first time in a specific plant. No women were employed before the war as gear shapers, hobbers, and cutters, optical-glass grinders, automatic-screw-machine operators, and tool-crib attendants in the New Jersey firms visited, and few as storeroom clerks and draftsmen or tracers. These more than any of the others seemed to be truly new jobs for women.

Women appeared to be replacing men more rapidly at machines than in any other type of work. Machine operators were less than a fourth of the women in pre-war jobs, but they were half of those who had recently been substituted for men. What is more, women appeared to be making substantial inroads into fields of machine operation different from those to which they had been accustomed. Whereas 3 in 5 of the women in pre-war machine jobs were coil winders or workers on other machines peculiar to the electrical industry, and punch or forming-machine operators, only 1 in 5 of the women substitutes were doing this work. Instead, they were operating drill presses, grinding and milling machines, various bench machines and lathes, in very substantial numbers. Factories making instruments and aircraft engines and propellers alone accounted for well over two-fifths of the women replacements on machines.

After the machine operators, the most important occupational groups from the standpoint of numbers of women in jobs formerly performed by men were assemblers and inspectors. The majority of the assemblers were in electrical firms and the factories making small metal parts. Two aircraft engine and propeller firms alone claimed more than half the substitute inspectors.

Women who were replacing men were still a relatively small proportion of the total workers employed on machines. This is not true, however, of any other occupational group. Women substitutes formed at least a fifth of all the workers in every other job where replacements had been made and in some they accounted for an even greater proportion. For example, they were a fourth of the assemblers, inspectors, and service or maintenance workers, about 3 in 10 of the storeroom clerks, well over two-fifths of the packers and wrappers, and all of the solderers where they had recently taken jobs previously held by men.

An important question arises when the replacing of men with women in factory jobs is discussed: Do the women actually perform the same work as the men before them or has it been necessary to adjust the job in some way? This question was asked of firm officials in the 67 plants surveyed in which women were employed as substitutes. Twenty-seven of the plants, or 2 in every 5, reported no adjustments of any

kind in any of the jobs in which women had been hired to replace men, but changes were made in 40 plants. Men were assigned in 18 of the 40 to set up and service the machines that women were taken on to operate. Men did the heavy lifting for the women on some jobs. In describing others, the management claimed in a few instances that women were given the easier, simpler, or lighter operations to perform. The jigs and dies were modified in one concern and in another a conveyor had been installed. A few firms reported that women did only one operation of a complex job, whereas men performed many.

Though women had been substituted for men on the drill press in 18 firms, in only 7 was it considered necessary to retain men to set up and service the women's machines. Likewise, in the case of lathes, the women performed their own set-up work in 8 of the 11 plants in which they were replacements for men. No adjustments in the job had been made for the newly employed women gear shapers and hobbers, optical-glass grinders, or automatic-screw-machine operators.

As their activities have changed or expanded, a number of firms have altered or added to the steps in their productive process, thereby developing in many cases an entirely new group of jobs. Nearly a fifth of the firms visited reported having hired women to fill such vacancies, well over half as inspectors, assemblers, or punch and forming-press operators, but many in other machine and hand operations. However, ordnance and electrical plants account for nearly all the openings for women in jobs that were new to the plant; these openings, furthermore, occupied but 5 percent of all the factory women employed.

New sources of woman labor.

From what sources have the many women who have recently entered war industries in New Jersey been recruited? Whether women have been hired for the first time or as replacements and additions to an already existing female staff, they have been secured by the great majority of firms from local inexperienced reservoirs, some never before in the labor force. Of 416 factory women visited in New Jersey who had been with their company 2 years or less, fully half had had

TABLE 7.—*Pre-war employment status of 439 women war workers*

Pre-war employment status	Women with 2 years or less of service in present plant				
	Total		Productive		Clerical—number
	Number	Percent	Number	Percent	
All women	439	100.0	416	100.0	23
Manufacturing, productive worker	211	48.1	207	49.8	4
Other	228	51.9	209	50.2	19
Beautician	6	1.4	6	1.4	----
Clerical worker	33	7.5	18	4.3	15
Domestic worker	33	7.5	33	7.9	----
Hotel, laundry, and restaurant worker	14	3.2	14	3.4	----
Housewife	87	19.8	87	20.9	----
Salesperson	15	3.4	14	3.4	1
Student	11	2.5	8	1.9	3
Teacher	5	1.1	5	1.2	----
Other	24	5.5	24	5.8	----

no experience in industry before taking their wartime productive jobs. One in every five had been recruited from the ranks of the local housewives and almost one in four from such groups as domestic, clerical, sales and service workers, beauticians, teachers, and students.

Rehiring of former employees who had left or been laid off occurred in approximately one-fourth of the plants; one-third reported taking transfers from other local firms. Few establishments were hiring women who had recently migrated from other areas, and in almost every case the proportion of newcomers taken on was insignificant. So far as women were concerned, in fact, in-migration appeared to present no problem in the New Jersey defense area.

It cannot be said from the data that women were not readily available for war work in New Jersey. Almost 2 in every 3 women interviewed secured their jobs by personal application at the plant and most of the others were recommended by a relative or friend. Few answered advertisements or resorted to the use of a private employment agency. Only 60 of a total of 689 women reporting used the public employment service.

Requirements for the employment of women.

The training required of women in the 137 plants surveyed was not then extensive. Well over three-fourths of the employers interviewed required no training of most of their women employees other than simple instruction on the job. In 8 cases, however, Vocational Education for National Defense courses were reported necessary. One ordnance plant required 6 weeks of outside training and in addition 2 weeks in the plant. A clothing factory was demanding 80 hours of outside schooling for machine operators and reported sending back for more instruction some who were inadequately trained in that time. Vocational training in soldering, testing, and assembling was required in one communication-equipment plant. Several firms wanted V. E. N. D. background for some jobs, but for others plant classes were held, or only instruction directly on the job was given.

In 14 factories surveyed, general classes or classes providing training for specific occupations were being held. For example, one plant reported special in-plant training on milling-machine and engine-lathe operation. An apparel plant was planning the training of 10 women as foreladies under the auspices of the "Training Within Industry" program sponsored by the War Production Board. Only two other firms reported training under this plan, and in both cases the emphasis also was on developing supervisory personnel. Vestibule schools were conducted in at least four places.

By the date of survey, however, only 6 women among 439 interviewed had received in-plant class training. A much larger number, comprising 1 in every 9 or 10 reporting, had been through an outside vocational school, but the great majority had had no special instruction except that ordinarily given directly on the job. Most of the women reported their training as having been adequate.

Educational requirements seldom enter the picture in hiring women for factory work, and few women were required to show experience of any kind to get a job in the New Jersey war plants surveyed. Only 19 plants of 182 reporting preferred experienced workers; 19 others

asked for experience in the case of specific jobs, but not generally. Actually, however, among 416 women interviewed and in factory work, at least half had industrial experience before taking their war jobs.

Besides training, experience, and education, requirements made of women war workers in New Jersey had to do for the most part with citizenship, age, race, and marital status. But only in the case of citizenship were definite and restrictive demands generally made. Almost all the employers interviewed except those in clothing manufacture demanded American citizenship or first papers. In most cases where aliens were employed, special investigation into their background, or special permission involving investigation by the War Department, was required.

There was almost no discrimination against married women working. Moreover, few employers set a maximum age beyond which women would not be employed. However, of 9 maximum-age limits reported, 4 were as low as 35; none were over 55. Most plants did not take women younger than 18. A physical examination was required by 24 of the companies surveyed.

It was the expressed policy in only a few firms not to employ Negro women on productive work. In most cases there were no such restrictions, though in a substantial proportion no Negro women actually were employed except in maintenance or service capacities, and the data in general show that Negro women were not doing factory work in significant numbers except in rare instances. Such cases include a large electrical firm in which Negro women were working not only in the factory but in the office. Also 3 clothing plants employed Negroes to the extent of at least 10 percent of the total productive labor force at the time of visit. Excuses offered by plant executives were that trained Negroes were not available or that Negroes were unable to meet health or other work standards; many reported that Negroes did not apply and some feared the result of Negroes working side by side with whites in the factory. In a few cases, companies that were not employing Negro women reported that they were considering taking some on in the future.

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III. CONDITIONS OF WORK

Working conditions were inspected and discussed in all plants visited. In connection with the suggestions made for improvements, bulletins of the Women's Bureau setting forth standards in sanitation and safety were distributed. These standards are based on the proved experience of many plants with women in their employ over a long period of years and represent conditions favorable to maximum output.

The suggestions made on hours of work were in agreement with the standards approved by the War Department, Navy Department, Maritime Commission, Public Health Service, War Manpower Commission, War Production Board, Commerce Department, and Labor Department in the summer of 1942. These standards, based on the results of scientific investigations made both in the United States and in Europe, recommended (1) a weekly day of rest, (2) a 30-minute meal period, (3) an 8-hour day and a 48-hour week, with overtime limited to extreme emergencies, (4) vacations.

Also very opportune was the publication in June 1942 of a report, "Optimum Hours of Work in War Production," by J. Douglas Brown and Helen Baker of the Industrial Relations Section of Princeton University. This too emphasizes the efficiency gained through lunch and rest periods and moderate hours of work.

All told, suggestions for the betterment of sanitary and safety conditions, hours, and industrial relations were made to as many as 136 firms. Usually, even when the general level of conditions was high there were isolated spots that needed attention; especially in large organizations, conditions varied from department to department. Occasionally as many as 8 or 10 suggestions covering specific points in almost the entire range of topics were made in an individual plant.[1]

The sudden demands made upon industry by the expanding war program were great. For example, one firm that had done largely experimental and custom work previous to Pearl Harbor had experienced almost a 100-percent plant expansion and had about 4 times as many employees as before; within a few months they probably would have 6 times the original number. At time of writing the employment is well over one thousand.

Obviously, service facilities were wholly inadequate for the enlarged work force, especially at hours of changing shifts or of rest periods, and a need developed for even an increased janitor force. For those occupying rented quarters these problems sometimes were doubled.

Furthermore, ingenuity was taxed by the increasing difficulty in obtaining material and equipment for service facilities. Much thought was expended in improvising lockers, shifting from metal to wooden seats, buying second-hand lunch-room equipment. Uncertainty as to the continuation of war contracts, as well as material

[1] *See* Women's Bureau Special Bul. No. 1. Effective Industrial Use of Women in the Defense Program. 1940. 22 pp.

shortages, was responsible in some cases for the delay in furnishing facilities adequate for the increasing number of employees.

Several firms were occupying new modern buildings or expecting to occupy them in the near future, and in such quarters housekeeping worries were at a minimum. But it was not always the new modern buildings where conditions were best; the old ones sometimes surpassed the new ones in housekeeping and comfort details. For instance, in the old building of one firm ventilation was described as "excellent, many fans, and heat not noticeable," but in the firm's new building, which was supposedly the last word; expansion had been so much greater than anticipated that workers were already crowded into dark, close corners originally intended for storage space and the firm was planning improvements in the new structure.

Some firms had been obliged to spread production into four or five scattered buildings and had taken over old manufacturing plants that had long stood vacant. In remodeling what was available they had more often than not done a good job, but they were expending additional effort to maintain uniformly good standards in a group of scattered buildings. Even when so pressed for production space they made room for the installation of service facilities, thereby decreasing congestion and time lost from work.

Of many plants, reports of the Women's Bureau agents contain some or all of the following: Facilities adequate in number, convenient and clean. Hot water, soap, and towels supplied. Comfortable chairs in rest rooms. Cafeteria patronized by production workers on all shifts. Full-time doctor and nurses. High stools for machine operators. Girls rotate on jobs to get change of position and break monotony. And so forth. Or in some cases: Efforts to increase rest-room, lunch, and first-aid facilities have been successful notwithstanding the difficulties involved. New building is fireproof; workroom airy, clean, fluorescent lighting; excellent ventilation. Old building very well kept up. Hot food service all shifts; good washing facilities; electrically cooled drinking fountain.

Much could be written about the model dressing and wash rooms, rest rooms and lunchrooms, or the prevalence of good-posture seats, of the last word in ventilating systems, and of the artificial lighting that was outstandingly good in the vast majority of plants, but the emphasis in this report has been placed rather on the shortcomings disclosed by the plant inspection so that the corrective measures indicated might be given attention as soon as this was possible.

The following discussion of the working conditions that called most loudly for correction is illustrated by extracts from reports of Women's Bureau agents who visited the plants and from the many revealing comments made by employees. In general, names and addresses of employees were furnished by management; trade unions and other public and private organizations contributed a number. In age the employees interviewed covered a wide range, from young girls to old women. About three-fifths were over 25 years of age, and more than half were married or widowed. Of this married and widowed group almost three-fifths had young children.

Frequently almost identical comments were made by several persons, but there has been no attempt to show the extent of such repetition; the quotations are merely samples.

HOURS AND SHIFT SYSTEMS

Acting on the first impulse to push up production by lengthening the workday, many firms had resorted to the policy of increasing the normal hours of women employees from 40 to 48, to 54, and sometimes to 56 and 60 hours a week, and from 5 to 6, sometimes to 7, days a week.

The New Jersey State hour law limits the employment of women to 10 hours a day and 54 hours a week. In no case did a firm report that the usual work schedule exceeded these limits, but there were individual exceptions where it did so in actual practice. For example, the firm's standard schedule beginning at 8 and ending at 5 had been stretched to begin at 7 and end at 6, making a week of 60 hours; and in some departments this work schedule was followed for all 7 days of the week.

In summary of the hour schedules reported by the firms: Most of the women in the New Jersey war factories surveyed were working more than 40 hours a week, except where clothing and other fabricated textile products and chemicals and drugs were being made. About one-third of the 137 firms visited reported a workweek of 48 hours for factory women; almost one-fourth showed a longer schedule. Twenty-two plants were employing women 54 hours, the full maximum allowed by State law. The longer hours were especially prevalent in ordnance, aircraft engines and propellers, instruments, and small metal parts, industries particularly vital in the war effort. Men's regularly scheduled hours were in many instances longer than women's, and, according to report, men more often than women were called on to work overtime.

An 8-hour day and a 6-day week was the most common schedule for women factory workers in the plants visited. Usually the office was on a different schedule from the factory, the women office workers being employed generally 8 hours or less daily, 5 or 5½ days, and 40 hours or less a week. A 9-to-10-hour day for factory workers was reported in 29 plants, 12 of these in ordnance or instrument manufacture alone. Few firms ran their factory shifts less than 8 hours, and few, other than apparel plants, were on the 5-day week. By and large the apparel factories visited were still operating on a routine of one shift of 8 hours daily and a 5-day week of 40 hours.

In order to legalize the employment of women after midnight, in December 1941 the New Jersey State legislature amended the statute which prohibits the employment of women after 12 midnight and before 7 in the morning. This amendment conferred on the Governor the power to suspend this restriction in time of war. Acting on this provision, numerous firms had applied for this privilege and in due time, after investigation, many had received permits to employ women on their third shifts. When the firms were visited in this survey, 5 of them were employing women after midnight without the permits as provided for in the amended law.

Though New Jersey law also limits employment to 6 days a week, there were occasional instances in which this provision as well was not being observed.

Calling attention to the relation of good hour standards to sustained maximum output, general recommendations were made in many of the plants on the length of the workday and the workweek. Also suggestions embodying standards for employment on night shifts

and rotation of workers from one shift to another were given to several firms.

TABLE 8.—*Usual weekly hours of women factory workers, by industry*

Industry	Total number of plants	Number of plants reporting weekly hours of—									
		Under 40	40	44	Over 44, under 48	48	Over 48, under 50	50	Over 50, under 54	54	Irregular or not reported
All industries	137	2	43	4	9	44	1	3	6	22	3
Aircraft engines and propellers	3	------	------	------	------	2	------	------	------	1	------
Ammunition, gun parts, and other ordnance accessories	15	------	------	------	------	5	------	2	2	6	------
Apparel and other fabricated textile products	27	------	22	------	1	2	------	------	2	------	------
Chemicals and drugs	5	------	3	------	1	1	------	------	------	------	------
Electrical products:											
Communication equipment	18	------	2	1	4	6	------	------	1	2	2
Motors, generators, and other electrical products	10	------	3	------	------	3	1	------	------	3	------
Wire and cable	9	------	2	------	1	6	------	------	------	------	------
Instruments, professional, scientific, and other	9	------	1	------	------	4	------	------	------	4	------
Machines and machine tools	4	------	------	------	1	3	------	------	------	------	------
Metal parts, small	9	------	1	------	------	4	------	------	------	3	1
Plastic products	3	1	------	2	------	------	------	------	------	------	------
Rubber products	4	------	2	------	------	2	------	------	------	------	------
Textile-mill products	8	------	3	1	1	2	------	------	------	1	------
Miscellaneous	13	1	4	------	------	4	------	1	1	2	------

There was no doubt about the attitude of employees as to the lengthened hours. They were most appreciative of the extra overtime pay, but comments, especially of those not new to industry, indicated a growing sense of fatigue, though coupled in many cases with an expression of willingness to try to keep up the pace for the duration. About the 7-day week especially they reported that the pace was exhausting and emphasized the need of recreation and time for their family and household duties. Some said very definitely that their production suffered. Typical statements made include the following:

No time to do housework, no time to be with family. It is too much.

Would prefer to work longer than 8 hours other days and have Sunday free. (Wage rate $22 for a 40-hour week.)

I take Sunday off occasionally to rest. Have lost weight since working 7 days. Am very tired.

I could not stand it any longer. (Had worked 10 hours a day, 7 days a week, for a few months.)

Other comments on long hours:

Working 6 days

It is the sixth day that fags me.

Five days would be better, but you'd not get the extra money.

It gives you extra money and that is handy, so I don't mind, but I am more tired. The day goes slower.

Working 9- and 10-hour days

You don't want overtime. Eight hours of that is enough.

Personally I'd prefer shorter hours; 54 hours are too many. You have no time for yourself. I can use the extra money, but it's what it takes out of you.

I'd like shorter hours, but I couldn't possibly get the work they give me done in 8 hours. I need 10 hours for that.

Only 2,201 women were reported on a night-to-morning shift, practically 4 in every 100 of those in factory jobs. In contrast, nearly 11,000 women were employed on the second or evening shift, and 44,600, or well over three-fourths of the women on production in all 137 plants, were working during the day. This is true in spite of the fact that twice as many factories were visited that operated three shifts as that operated two or only one. Approximately 1 in every 9 workers on the third shift, and 2 in every 10 on the second, were women. There were nearly 3 women in every 10 workers on the day shift. Twice as large a proportion of men as of women were employed on the "graveyard" shift.

TABLE 9.—*Employment of women on the various shifts, by industry*

Industry	Total number of plants	Number of plants employing women on—			Number of plants operating—		
		1 shift only	2 shifts	3 shifts	1 shift only	2 shifts	3 shifts
All industries	137	59	51	27	32	35	70
Aircraft engines and propellers	3			3			3
Ammunition, gun parts, and other ordnance accessories	15	7	6	2		11	4
Apparel and other fabricated textile products	27	25	1	1	25	1	1
Chemicals and drugs	5	1	1	3		2	3
Electrical products	37	12	15	10	4	8	25
Communication equipment	18	4	7	7	3	4	11
Motors, generators, and other electrical products	10	6	3	1	1	3	6
Wire and cable	9	2	5	2		1	8
Instruments, professional, scientific, and other	9	2	5	2	1	4	4
Machines and machine tools	4	1	1	2		1	3
Metal parts, small	9	4	4	1		3	6
Plastic products	3	1	1	1			3
Rubber products	4	1	2	1			4
Textile-mill products	8	1	6	1	1	1	6
Miscellaneous	13	4	9		1	4	8

In general, women who have worked on either the evening or the graveyard shift do not like it. The most frequent reason given concerns irregularity in sleeping and eating, resulting in fatigue and sleepiness during working hours on the one hand, and indigestion and loss of weight on the other. Young people complain that the evening shift interferes with recreation and social life. Married women object to being away from their families in the late afternoon and evening, and many perform their household tasks during the day and are tired when worktime comes. Of those who reported that they liked night work, the chief reason given was the fact that they had the daytime hours free in which to take care of their children and do their housework. Not infrequently their husbands were on the day shift and took over the children's care when the women left for work. Some women prefer the night shift because the noise and confusion are considerably reduced, and a few like it in summer because it is cooler.

Married women, especially those with children, were somewhat more numerous than single women among those who preferred to work in the evening, that is, on the second shift. Thirty percent of the 696 women workers interviewed had children. Most of these

mothers had more than one child, and in four-fifths of the cases at least one of the children was under 14 years old. A substantial proportion of the mothers had children under 6. Children in the younger groups require constant adult supervision and care. Those who are attending school should be in a responsible person's charge before and after school hours, yet of 167 monthers with children under 14 years, as many as 38, well over one-fifth, left their children to their own devices while at work. The children simply took care of themselves. More than half the workers left their young children with husband or other relative and some had older children who took care of the younger. Few of the mothers employed help or patronized a day nursery. These data indicate a very real problem in view of the increasing number of housewives who are taking war jobs in industry.

TABLE 10.—*Employment of women factory workers,*[1] *by industry and shift*

Industry	Total		Women on—					
			Day shift		Evening shift		Night shift	
	Number of plants	Number of women	Number	Percent	Number	Percent	Number	Percent
All industries	137	57,717	44,601	77.3	10,915	18.9	2,201	3.8
Aircraft engines and propellers	3	1,812	1,033	57.0	440	24.3	339	18.7
Ammunition, gun parts, and other ordnance accessories	15	4,806	3,705	77.1	902	18.8	199	4.1
Apparel and other fabricated textile products	27	5,323	5,235	98.3	54	1.0	34	.6
Chemicals and drugs	5	870	672	77.2	105	12.1	93	10.7
Electrical products	37	25,697	20,304	79.0	4,548	17.7	845	3.3
Communication equipment	18	21,931	17,204	78.4	3,985	18.2	742	3.4
Motors, generators, and other electrical products	10	2,799	2,544	90.9	253	9.0	2	.1
Wire and cable	9	967	556	57.5	310	32.1	101	10.4
Instruments, professional, scientific and other	9	6,545	4,600	70.3	1,426	21.8	519	7.9
Machines and machine tools	4	501	324	64.7	124	24.8	53	10.6
Metal parts, small	9	1,447	1,183	81.8	246	17.0	18	1.2
Plastic products	3	454	371	81.7	65	14.3	18	4.0
Rubber products	4	909	706	77.7	195	21.5	8	.9
Textile-mill products	8	6,703	4,609	68.8	2,019	30.1	75	1.1
Miscellaneous	13	2,650	1,859	70.2	791	29.8	----	----

[1] Excludes women in the office.

Though many of the firms had employed married women and mothers habitually for years, there were evidences that on the whole management was now giving thoughtful consideration to the policy of employing those responsible for young children. Occasionally, however, an employer expressed himself by saying, "It is no concern of mine if the women have children at home." Most felt that during the present emergency it would be more or less necessary to employ these mothers, but that the care of the children and other household burdens were the problem of the individual mother.

Very few of the women visited worked from midnight to morning. Of those who did, the following are typical comments:

> Working 12 to 8 a. m. is hard on the nerves. Your vitality is low.
> You don't get your proper rest. Well, not in this house, with the children to keep you awake.
> Time after 12 midnight is the hardest to work.

Company hired all new women for the third shift because old employees wouldn't do it.
I get sleepy when working nights.

The Women's Bureau recommends[2] that work after midnight be resorted to only as the lesser of two evils in an emergency, the other being long overtime hours for day and evening shifts. Further, measures should be taken when night work is introduced to moderate its difficulties and dangers. One of the methods by which this may be done is the rotation of shifts at intervals long enough to allow sufficient time for readjustment and rest. Rotation should not occur so often as every 2 or 3 weeks nor so infrequently as to develop chronic fatigue on the part of night workers. Though it is difficult to suggest a set rule, since conditions vary widely and authorities differ in their recommendations, the optimum for most cases appears to be between 1 and 4 months. There is universal agreement among authorities that excessive fatigue is engendered in both day and night workers, with consequent lag in production, if shift rotation is too frequent or if night work is continued too long.

In nearly half the plants in which women worked on more than one shift there was no rotation of shifts. Of those that did rotate, three-fifths changed every week and only two firms changed so infrequently as once a month, the longest period reported without a change of shift.

The following summarizes comments made by some of the women visited concerning the rotation of shifts:

Rotating weekly

Just get used to it when we change again.
Rotation every 2 weeks or every month would be better, as it would not be quite so upsetting to meal hours.

Rotating every 2 weeks

Just get into one routine when you have to break it for another.
No more rotating for me. It had me crazy.

Several, however, felt that rotation was fair, as thus all shared alike. The day of shift changes was difficult for some—arriving home at 1.30 a. m. from one shift and getting up at 5.30 to be at work by 7 for the next day. "That was tough. That kept me tired all the time. When the shift changed you got no sleep."

LUNCH AND REST PERIODS AND PLANT PROVISION FOR FOOD

With the increasing pressure for sustained effort to achieve high production rates day after day, week after week, and month after month, emphasis on nutrition and health is more necessary now than at any previous time. The importance to war production of rest periods, of an unbroken lunch period, and of hot food or at least a hot drink at lunch time in a clean and convenient place away from the job cannot be too strongly stressed.

[2] *See* Women's Bureau Special Bul. No. 6. Night Work for Women and Shift Rotation in War Plants. June 1942. 8 pp.

A type of cafeteria that serves the purpose well in one plant may not be feasible in another, but something more than a counter with the usual candy, cake, and "cokes" should be available.

Specific suggestions were made to about one-third of the firms relative to the advisability of allowing at least 30 minutes for lunch and short rest periods in each work spell, and in no less than 29 plants where practically no provision had been made for lunchroom facilities or food definite recommendations were made for such equipment.[3]

Fully aware of these shortcomings, more than one manager discussed the lack of food facilities and their plans for future improvements. They expected to have "better facilities ready by fall," or said "We plan to have a cafeteria in our new building." As already mentioned, difficulty in obtaining equipment was a serious obstacle.

Food was available in 48 (just over one-third) of the 137 plants scheduled. Of this number 30 had cafeterias and restaurants serving a variety of foods, in 9 plants there were lunch counters, food bars, and canteens, and in 9 arrangements could be made with vendors for box lunches. Though lunch facilities in general were inadequate, more than one woman interviewed referred to the fact that in her plant hot coffee was furnished free. Over one-half (73) of the firms provided nothing in the way of lunchroom facilities or food, and more than a tenth of all had only a space with tables and chairs but no food. No firm with fewer than 750 workers maintained a cafeteria or restaurant, and only 4 of the 30 with cafeterias had fewer than 1,000 employees. Though no evaluation was made of the food service given, at several of the lunch counters and canteens little more than a snack—a bit of pastry, a candy bar, or a soft drink—could be purchased, and management assumed no responsibility for the adequacy and quality of such food supply.

Neither were all the cafeteria arrangements perfect. Workshops in some cases were too remote for employees to make use of the cafeteria services in the short time allowed for lunch; others were too expensive; some were too small to take care of the large numbers, even by staggering the lunch periods. A few apparently catered only to office and supervisory help, so were avoided by the production workers.

On the other hand some firms, convinced of the dependence of efficient production on proper nourishment, made every effort to serve good and appetizing food. In addition to central cafeterias a few large firms had service to the workrooms. One such is described as follows: "A large cafeteria, attractive and cool, with excellent and cheap food available for all shifts. There is also an organized routing of wagons from the cafeteria to each workroom, and these carry soup, vegetables, meats, salads, desserts, and beverages, which may be eaten at the workbenches or in rest rooms convenient to the shops."

Another large firm served all employees on all shifts in the cafeteria by staggering the lunch periods. The service was operated at a slight deficit, but the company felt it was worth it and furnished food at cost. Other cafeterias were described as "complete"; one as "furnishing

[3] *See* Women's Bureau Special Bul. No. 5. Women's Effective War Work Requires Time for Meals and Rest. May 1942. 4 pp.

substantial meals at cost for three shifts." Of another it was said, "Cafeteria available for workers on the first and second shifts, but only canteen with cold food for third shift." Some employee objections to the night shifts were that they could buy no food in the plant on the second shift and at night.

In the plants with no lunchroom conveniences—almost two-thirds of all—thousands brought their lunches from home and for the most part ate at their work benches, many of which were dusty and dirty from the nature of the work.

For the majority the only alternative to eating at their work tables was to "lunch in the dressing room," "in the crowded washroom," "in a corner of the toilet room," "in the warehouse, but if it is nice we go outdoors." Of one plant it was said, "The girls need a place to eat. It is too dirty and dusty to eat in the workroom. It is not pleasant to eat in the toilet room and it is expensive to eat out."

Twenty-six of the firms, including 20 in the apparel group, made no provision for lunchrooms or food but allowed 1 hour for the noonday break so that there was time to go to nearby restaurants and drug stores or to go home. Many of these plants were in small communities and drew largely on the immediate neighborhood for their employees. For the employees who did not live fairly near there was no choice but to eat a cold lunch at the workbench or to go to an outside lunch counter.

Size of plant appeared to have some relation to food service. In numbers employed the plants ranged from less than 100 in a few cases to over 20,000 in two. Of the total 137 firms reporting, more than one-fourth (38) had less than 250 employees; 27 had 250 and under 500; 19 had 500 and under 1,000; and 53, about two-fifths of all, employed 1,000 or more. Of the 53 firms with 1,000 or more employees, 26 had cafeteria or restaurant service of varying degrees of adequacy, but 17 had made no provision whatever for food service though 4 had set up tables and benches. In the others there was some sort of canteen or food bar, a number serving soup, sandwiches, milk, and coffee, but several were very inadequate. Thus two-thirds of the largest plants, in contrast to just over one-third of all plants, provided food service of some sort, in most cases cafeterias or restaurants.

In March 1942 the New Jersey legislature amended the statute requiring at least half an hour for a meal period after continuous employment of not more than 6 hours. The amendment gave the Governor authority to suspend this provision during the present war but only after investigation showed that an order suspending the lunch period would not "in any way impair or endanger the health or productive effectiveness of those affected by such order."

At the time of this survey the half-hour lunch period prevailed in the plants covered and no official permits had been issued that granted suspension of the 30-minute lunch period. In 6 establishments, however, employees were working through the shift without any lunch period and in 11 others employees were limited to 15 or 20 minutes for lunch.

The "work while you eat" plan was limited to the textile and wire industries. It did not affect all departments but prevailed where some of the heaviest jobs were performed, as for example the card, spin and spool, and weave rooms in the textile mills and the braiding and weaving in the wire mills, departments where much of the work

was piece work and the deafening noise and vibration of the machinery never stopped.

This was not a new policy arising from pressure for greater war production, for this generation of weavers had inherited the custom from their fathers. One manager insisted that no official permit was needed to shorten the lunch period, as they had operated this way for years and the workers had always managed somehow to get something to eat while they watched their machines; it was no hardship.

It is noteworthy, however, that in other plants in this vicinity and in other States which were keeping up their production schedules on similar and sometimes identical Government items the power is turned off, the machines stop, and the workers pause for a period of rest and refreshment.

One young woman described her 15-minute lunch period as follows: "Can't leave work until the buzzer rings. Must rush to rest room to eat and rush back. Have to wash up and must choke the food down. Do not have time to eat, for if we get back to work after the buzzer rings they give us an argument and say they'll cut our pay for being late."

Expressions from other women indicate how they regarded the policy of having only 15 or 20 minutes free for lunch, or no time whatever.

> Walk and eat at the same time.
> Sometimes bring lunch back home with me. Don't have a chance to eat it.
> Frequently don't eat because there is too much wool to watch.
> Walk all day back and forth; machines never stop.
> No time off for weavers. We eat as best we can while machines keep running.
> We eat while working. This is no good. At——— (competing company) they have half an hour to eat and make as much in 7½ hours as we do in 8.
> Who could get to the cafeteria and back in 15 minutes?
> We get indigestion; it is always hurry.
> Cannot sit down. Must swallow food while the machine runs.

Operators of machines fitted with automatic stops found it easier to adjust to the no-lunch-time policy, but even so they stood by ready to make the necessary repairs.

The plants allowing only a 15-to-20-minute break represented various industries but were alike in that all were operating 24 hours around the clock with three 8-hour shifts. Further, employees were paid for 8 hours, including the short meal period on the company time. In some cases the union had bargained for this concession by management in recent years and this fact undoubtedly colored the discussions of lunch periods with the employees. While admitting the inadequacy of 15 minutes, one woman probably expressed the attitude of many when she added, "but I prefer 15 minutes with pay to half an hour without it."

Despite the fact that they were paid for this brief lunch period there was evidence that some had not become adjusted to it. An industrial nurse from one of these plants reported several cases of nervous indigestion, thought to be caused by bolting lunches.

Further, of these 16 firms that had either no lunch period or a very short one only 1 provided for a formal rest period at any time during the work shift. In fact, only 25 firms of the entire number

visited were reported as having formal rest periods, customarily from 5 to 10 minutes in each work turn.

WAGES

Where men and women were on the same job for the first time in the war emergency and worked on a time basis, almost two-fifths of the plants reporting current entrance rates were paying both sexes at the same rate. There was no apparent controlling difference, in the scheduled sample, between the plants that had and those that had not a wage differential based on sex. As might be expected, in jobs where there was no such differential women generally could command higher rates than where a differential existed. Not one of the firms paying women the same hourly rates as men offered them less than 48 cents for any job, whereas there were 11 separate jobs on which women began at less than this figure in plants with a differential.

The principle of the rate for the job, regardless of the worker's sex, has been advocated officially or ordered put into effect by nearly a score of agencies of the Federal Government over more than 40 years. Now especially this principle should prevail in order that the war effort may be strengthened at home through all-round industrial efficiency and democracy. Discrimination in wages paid to men and to women was one of the causes of discontent among the workers in several of the factories visited in New Jersey. To illustrate with two or three cases:

> In soldering the same parts, the scale for women ranged from 50 to 53 cents while that for men ranged from 70 to 90 cents.
>
> Men operating the same drill presses on identical parts had a 10-cent higher base rate than women, though women excelled in production.
>
> Women resented the fact that irresponsible young boys were hired as chore boys at a beginning rate of 60 cents while women's minimum was 45 cents and many who had worked for years were still earning less than 60 cents.

None of the 132 plants reporting on entrance rate started women at less than 35 cents an hour; in fact, 6 in every 10 offered women a beginning rate of more than 40 cents. About three-fourths of the factories paying 40 cents or less were in only two industries, clothing and electrical products; almost half were in clothing alone. In 13 of the scheduled firms women were receiving at least 60 cents an hour to begin with, and in 8 of these plants women productive workers were an innovation with the wartime emergency.

Where the minimum entrance rate was less for women than for men, the difference amounted to 10 cents or more in two-thirds of the cases. In well over half the firms where the minimum entrance rate was the same, both men and women were getting 40 cents or less.

A definite wage-progression policy was followed in a significant proportion of the factories in the survey, but especially in those making communication equipment, ordnance, and small metal parts. A popular plan was to raise the worker about 5 cents an hour after a period of service of 3 months or even less. In a number of firms automatic wage raises were spread over two steps and in a few there were three, and even four or five steps, but the total amount of increase seldom exceeded 15 cents an hour. An established wage-progression policy was followed in many firms even where there was

no regular learning period. After the basic rate for the job had been reached in the case of learners or all automatic increases had been earned, further progress depended on skill and seniority.

There were scores of firms, however, in which management admitted during the interview that there was no definite policy of wage progression. "It is pretty much up to the foreman." And in too many companies there was evident need of interpreting to the workers in simple language the company policy in regard to job rates, wage raises, and the production bonus, where this was in effect. Ignorance and confused ideas were expressed repeatedly by the women about the method of computing production-bonus payments.

Well over three-fifths of the women time workers for whom data were available were paid at the rate of at least 60 cents an hour. The 5-cent interval 65 and under 70 cents claimed a very much larger group than any other. (See tables 11 and 12.) Rates paid women time workers differed considerably, however, according to industry. Only two of the industries represented in the survey, electrical products and small metal parts, paid at least 60 cents to more than three-fifths of their women time workers. In the remaining industry groups less than half the women time workers were paid this much; not quite one-third of those in machine and machine-tool plants were so reported. No women were paid at the rate of less than 50 cents in the aircraft engine and propeller plants, and in each of the industries covered few if any had an hourly rate under 45 cents. In instrument manufacture 25 percent of the women time workers for whom data were available, in contrast to 6 percent in all the industries together, were paid 45 and under 50 cents an hour.

According to table 12 the most highly paid occupational group among the women time workers for whom data were reported were the job setters, followed by machine operators in the electrical-products industry, coil and armature winders, and assemblers. Painters and solderers commanded comparatively low rates.

Women who worked on the second and third shifts, and especially those on the third, generally received a wage differential of some kind. In most cases the differential was a percent increase or additional sum

TABLE 11.—*Percent distribution of women time workers according to hourly rate, by industry*

Industry	Number of women time workers reported	Percent of women time workers with hourly rate of—							
		Under 45 cents	45, under 50 cents	50, under 55 cents	55, under 60 cents	60, under 65 cents	65, under 70 cents	70, under 75 cents	75 cents and over
All industries [1]	18,182	1.3	5.7	6.7	23.0	11.1	36.8	7.8	7.7
Aircraft engines and propellers	624	-------	-------	12.3	38.3	21.2	-------	6.6	21.6
Ammunition, gun parts, and other ordnance accessories	3,245	.8	6.0	19.3	37.7	9.3	10.9	1.1	14.9
Chemicals and drugs	154	-------	5.2	41.6	5.8	31.2	3.9	12.3	-------
Electrical products	9,779	1.4	3.2	2.8	12.4	4.4	62.9	9.0	4.0
Instruments, professional, scientific, and other	577	5.0	25.3	8.0	23.2	13.7	2.4	13.0	9.4
Machines and machine tools	306	-------	15.4	-------	52.0	7.5	8.2	-------	17.0
Metal parts, small	1,141	3.3	18.0	.9	6.4	37.0	3.2	25.2	6.1
Textile-mill products	1,292	.5	8.5	1.5	54.3	27.0	2.8	1.0	4.4
Miscellaneous	1,064	-------	.5	9.2	40.6	21.8	6.9	5.6	15.4

[1] Apparel, plastic, and rubber industries not included; too few time workers reported.

TABLE 12.—*Number of women on a piece-rate and on a time-rate basis and percent distribution of time workers according to hourly rate, by occupation*

Occupation	All women			Women time workers with hourly rate reported							
	Total number	Number on—		Total number with rate reported	Percent with hourly rate of—						
		Piece-rate basis	Time-rate basis		Under 45 cents	45, under 50 cents	50, under 55 cents	55, under 60 cents	60, under 65 cents	65, under 70 cents	70, under 75 cents	75 cents and over
All occupations	[1] 31,495	9,926	21,569	16,183	1.5	5.9	5.7	19.8	10.3	41.2	7.3	8.3
Assembler	11,192	2,675	8,517	6,183	0.8	2.2	3.0	11.2	3.8	76.8	([3])	2.1
Bench worker, hand	552	238	314	114	3.5	1.8	12.3	21.9	37.7	7.0	7.0	8.8
Bench worker, machine	824	483	341	249	2.0	2.8	8.0	47.0	2.0	.8	----	37.3
Draftsman and tracer	17	----	17	[3] 11	----	----	----	----	----	----	----	----
Drill-press operator	1,195	482	713	528	2.3	3.4	20.8	13.3	31.1	12.5	11.2	5.5
Forelady	73	1	72	[3] 32	----	----	----	----	----	----	----	----
Gear-cutting-machine operator	21	21	----	----	----	----	----	----	----	----	----	----
Grinding-and-polishing-machine operator, optical glass	49	41	8	[3] 8	----	----	----	----	----	----	----	----
Grinding-machine operator	389	257	132	117	7.7	----	----	43.6	14.5	2.6	----	31.6
Hand worker n. e. c.	2,431	855	1,576	1,316	.7	14.9	1.4	36.5	11.1	12.2	7.6	15.7
Inspector	5,236	931	4,305	3,190	1.9	11.4	4.2	25.1	13.3	28.0	5.5	10.7
Job setter	148	----	148	148	----	----	----	----	----	----	----	100.0
Lathe and screw-machine operator	428	246	182	70	7.1	2.9	21.4	22.9	18.6	20.0	----	7.1
Machine operator n. e. c., in electrical products	1,291	355	936	901	3.9	3.4	3.9	.3	4.0	2.3	79.0	3.1
Machine operator n. e. c.	1,568	712	856	457	1.5	14.4	17.9	28.7	5.5	5.7	10.3	16.0
Milling-machine operator	210	105	105	98	1.0	2.0	21.4	13.3	----	28.6	----	33.7
Packer and wrapper	1,317	616	701	572	----	3.1	16.1	32.2	22.4	13.6	2.1	10.5
Painter	322	86	236	159	----	17.6	29.6	30.8	11.9	6.9	3.1	----
Punch- and forming-press operator	1,347	606	741	635	.3	10.1	2.4	37.8	30.1	1.1	9.1	9.1
Service and maintenance worker	348	----	348	309	.3	2.6	27.5	19.1	42.4	4.9	1.0	2.3
Solderer	853	431	422	254	----	.8	----	79.1	3.5	3.9	----	12.6
Storeroom clerk	71	48	23	[3] 20	----	----	----	----	----	----	----	----
Tool-crib attendant	58	19	39	[3] 36	----	----	----	----	----	----	----	----
Welder	105	15	90	[3] 39	----	----	----	----	----	----	----	----
Winder, coil and armature	1,450	703	747	707	5.1	----	4.0	1.0	7.9	79.5	----	2.5

[1] Apparel and textile-mill products excluded, as occupations not comparable with those in other selected industries.
[2] Less than 0.05 percent.
[3] Percent distribution not computed; base too small.

above the regular hourly rate. Where the former prevailed, it amounted usually to 10 percent; where the latter, to 5 cents. In a few plants the differential was paid in decreased working hours. For example, in two of the firms visited women on the third shift worked respectively one hour and one and a quarter hours less than the period for which they were paid. In five plants the second shift worked 15 or 30 minutes less than paid for. Seven plants had reduced hours and gave in addition a percentage or flat increase in rate.

Wages had increased since the defense and war periods began. In the plants reporting, the increase amounted to approximately 16 percent; the rise appeared to be even greater in firms then making ordnance. Assemblers had had an increase of about 21 percent, but the rates of coil and armature winders, maintenance and service workers, and machine operators in the electrical-products industry had risen less than 5 percent.

Of the 696 women visited in their homes, 203 reported their present time rate and also the rate they were paid on their present or a different job before the war. The great majority of them, about 9 in 10, had received an increase; 8 women said their rate was the same; as many as 12 stated that their rate had decreased. Several of them commented that, though their hourly rate was less, their weekly earnings were greater because of longer hours and overtime pay. The increases in rates amounted to from 10 to 43 percent, with the higher proportional increases occurring among those commanding generally the higher rates of pay.

Dissatisfaction with earnings was widespread among the women interviewed. The feeling doubtless had been augmented by reports of the high wages paid in some of the newer war plants, and there is no question but that average earnings were lower in establishments that had long relied on female labor than in those where women's employment was more recent.

The experiences of some of the women indicate the reasons for their discontent. In one factory where there was much resentment among the older employees, some who had been with the firm as long as 5 to 8 years were earning 53 cents an hour on final inspection and blueprint reading, which was no more than new girls were earning with only a 5-month service record. "Old girls are quitting because new girls make the same as they do." In another industry older employees were critical because they had worked for 5 years or more without a raise and now were making little if any more than employees hired recently for the same kind of work. An instance was quoted of an inspector who had a higher rate after 7 months than others who had been similarly employed 15 years. "Older ones get no raises. Knowledge and experience of the old girls don't count."

A woman who had operated a drill press for a year was resentful because she was earning only 40 cents an hour. In spite of this she was staying on the job because it was "so near home." Another explained that girls will not pay carfare to come from a distance to work here because the place has a bad reputation for low wages. In the same plant a spray painter was earning 50 cents an hour, and, she added, "I am one of the highest paid there." Still another said, "New girls do not stay very long. They can do better in other places. Only the older women stay."

EXPOSURE OF WOMEN TO HEALTH HAZARDS

Effect of war conditions on industrial health.

The increasing diversity of women's work in the war program has implications not only for greater opportunity to use talents and to secure better wages than in more customary women's employment; it also brings about the exposure of women to toxic materials to which they rarely have been exposed in modern American industry.

In the plants surveyed in New Jersey women were at work on a great variety of occupations exposing them to diverse hazards. Not only had the number of hazards and the number of exposed women increased, but exposures themselves were found to be intensified by many factors: (1) Longer hours, (2) shortened lunch periods, (3) pressure for increased production, (4) overcrowding of workers, (5) use of makeshift washing facilities, (6) allowing too little time for washing and cleaning up before leaving work, and (7) increased fatigue because of constant standing, reaching, standing on concrete floors, sitting on backless stools or chairs of the kitchen-chair variety.

Fatigue always lowers resistance to occupational poisons as it does to other diseases. The longer the hours the longer the exposure to the poisons. If washing is not adequate the worker may be exposed for 24 hours a day through her contaminated skin or clothing. The poison may even be ingested with food if hands and nails have not been adequately washed. Doubling and trebling the number of people in the same working space may mean that ventilation adequate for the smaller number needs retesting for the larger number. A final factor is equally important—the difficulty of providing adequate medical care, including physical examinations, coupled with the increasing percentage of applicants who are physically below par.

A great many more or less unfamiliar industrial poisons have come into use with the necessity for accelerated production of explosives, synthetic rubber, and all the numerous articles of Army and Navy ordnance as well as substitutes for civilian consumption.

Potential exposures of women.

The industries surveyed in New Jersey expose women to a number of harmful materials or conditions. These may be classified as follows:

Skin irritants:
- Benzol (see also under systemic)
- Tetryl
- Mercury fulminate
- Mica dust
- Pyranol
- Glass silk
- Materials used in manufacture of plastics
- Dyes of various kinds
- Cutting oils and compaunds

Systemic poisoning:
- Lead oxides
- Benzol
- Radium
- Tetryl
- Mercury
- Carbon monoxide

Respiratory diseases: Silica dust; steel dust; mica dust.
Acid burns—Nitric acid
X-ray burns—X-ray
Heat prostration—Excessive heat

Systemic poisoning.

There is evidence that most firms recognized the serious possibilities of these exposures and were using approved engineering and

medical methods of control. This was particularly true of the systemic poisons listed. The following brief descriptions indicate this:

Lead exposures.—Girls employed on weighing and blending dyes, which consist of lead compounds, are provided with two sets of lockers. Work clothing is placed in one locker, a shower is taken, and street clothing from another locker is put on. Every 3 months a medical examination determines whether the girl is being affected by her work. The company has through its precautions had no case of lead poisoning in 9 years of operation.

A company employing girl inspectors of white tin plate believed that cuts and scratches could result in lead poisoning, so its emphasis was on immediate first aid for the slightest abrasion. Such exposure would be very slight compared to work with lead dust. It has been established that respiration of lead is most to be feared.

Radium exposures.—The use of radium in instrument manufacture was under such carefully controlled conditions as have been recommended by the United States Public Health Service. Painting was done on work tables of enameled metal under glass-enclosed hoods equipped with exhausts by girls under constant medical surveillance. Conditions for maintaining their health were prescribed. No personal property was brought into the workroom; the washing routine was rigid and was done on working time. After washing with soap and hot water the radium painter entered a dark room containing mercury lamps which showed up minute particles of luminous material. Further cleansing removed these particles. Check was made on the radon concentration in the workroom.

Benzol poisoning exposures.—Women working with rubber cement having a benzol base were inadequately protected, special medical tests indicated. The women themselves reported the fumes so strong they got "drunk" from them. Engineers were working on a means for better ventilation and control under the working conditions necessitated by the job.

Mercury exposures.—Girls exposed to mercury in the manufacture of mercury lamps were under medical supervision. Medical examination was made twice a month. Particular attention was given to dental health. A special solution was provided for teeth cleaning. Showers not only were available but their use before leaving the plant was required. Every effort has been made by these plants to have working conditions as safe as possible.

Dermatitis producers.

Tetryl.—Tetryl is a common industrial exposure to women in explosives manufacture. Whether it can be the cause of systemic poisoning as well as dermatitis is a question now before industrial hygienists, who differ in their conclusions. In a report in 1942 on 1,258 cases of illness due to tetryl, its toxicity was said to have both local and systemic effects. General manifestations were described as secondary anemia, headache, irritability, and irregular menstruation.[4] During World War I it was reported by one British industrial physician, Dr. Enid Smith, that constitutional symptoms were slight. An-

[4] Leon J. Witkowski, Carl N. Fischer, and Howard D. Murdock. Industrial Illness Due to Tetryl, Journal of American Medical Association, Aug. 22, 1942, pp. 1406–1409.

other physician with women tetryl workers under his care reported disagreeable effects in a watery discharge from the nose, sneezing, and nosebleed. This same physician mentioned as a symptom of tetryl poisoning a cessation of menstruation of 1 to 3 months' duration.[5] Constitutional symptoms are infrequent but operators should be under careful medical supervision.

Tetryl powder frequently gives rise to irritation of the skin partly because of its crystalline structure and partly because of its chemical nature. The dermatitis may be severe, with swelling and intense itching. Workers who perspire freely are more likely to suffer from it.

Important in prevention are a well-ventilated workroom with a dry atmosphere, sufficient clean work clothing, and adequate washing facilities. Workers should be instructed to wash their hands before washing their faces. In addition to a good quality of soap, the use of a 5-percent solution of sodium sulphite will convert tetryl into a soluble compound more easily washed off. A water-soluble skin varnish applied to face and forearms before work has been found useful.[6]

Fulminate of mercury.—Another common exposure to women in ammunition manufacture is mercury fulminate. It is rapidly being replaced by tetryl and lead azide. Because of the highly explosive nature of the fulminate, strict observance is given to avoidance of dust, scrupulous cleanliness, and a separation of processes, all of which decrease the risk of exposure. Fulminate of mercury is a very decided skin irritant and may cause a severe case of dermatitis. Particles may get into small cuts or abrasions and cause small, very sore, ulcers. Applicants for such work should be free from skin disease, and workers should observe strict rules of cleanliness.

Cutting oils.—A number of metal-manufacturing companies reported cutting oils and compounds as the principal dermatitis exposures to their women employees on machine work. Control of these infections as described to the agents consisted in adding an antiseptic to the oil in one plant; in another to medical check and transfer of affected workers, as well as choice of applicants for such work who have no skin lesions.

Cutting oils are the most frequent cause of dermatitis among metal workers, according to reports of United States Public Health Service. Prevention among women workers merits much attention because of the great increase in woman employment in metal industries. New employees not selected on the basis of susceptibility naturally show a high rate of cases.

The dermatitis may begin with comedones of the hands and arms. Folliculitis of arms and thighs is the common type. Infected follicles may develop into boils and even carbuncles, and infection of wounds of the skin caused by metallic slivers may cause the development of boils. The defatting action of cutting oils on the skin may cause drying, cracking, and fissuring. The open fissures are subject to secondary infection. Dry skins are most likely to be affected in this way. Some of the oils may contain chlorine compounds, the dermatitis taking the form of a typical chloracne. Allergic eczemas occasionally

[5] U. S. Bureau of Labor Statistics, Bul. 219. Industrial Poisons Used or Produced in the Manufacture of Explosives. By Alice Hamilton, M. D. 1917. p. 48.
[6] Journal of Royal Army Medical Corps, Vol. 71, 1938. Treatment and Prevention of Industrial Diseases in Filling Factories. By A. Leigh Silver, M. D.

occur from contact with machine oils. The addition of strong antiseptics to the oil may itself be the cause of such skin infection.[7]

Briefly summarized, prevention should include (1) provision of facilities and time for personal cleanliness, (2) clean work clothes and impervious sleeves and aprons to protect arms and thighs, (3) provision of clean towels for wiping hands, (4) removal of metal slivers from oil, (5) change of oil at least once a week. Re-used oil should be screened to remove metal, sterilized, and neutralized. Of these, personal cleanliness is the most important item.[7]

Plastics.—A variety of materials used in the manufacture and handling of plastics and dyes may cause dermatitis among susceptible persons. In plants where such reactions were reported, the control method considered best was transfer of the susceptible worker to another job. When transfer was impossible the affected worker was given time off from work until the skin condition cleared up and on return to the job protective creams or protective gloves were furnished.

Mica.—Exposure to mica dust noted in another plant was stated to have caused skin irritation. They tried transferring these girls to other work for 2 weeks, after which it might be 2 months before the rash appeared again. Gloves were furnished by the company.

Mica dust exercises an irritant mechanical action on the skin, the eyes, and the respiratory passages. Authorities refer to cases of eczema and ulcerative lesions among workers making micanite.

It is also said to enter the respiratory and digestive passages, which it impregnates, giving rise to a disease rare in this country, designated as "silicosis universalis." Mica dust should not enter the breathing area of workers but should be controlled by systems of ventilation.

Respiratory diseases.

In a number of instances women were found needlessly exposed to harmful dusts. In one the women were fettling small porcelain parts without adequate exhaust ventilation. That this operation may cause dangerous concentrations of silica dust is shown by the 1939 study of the pottery industry made by the United States Public Health Service.[8] The study also shows how harmful concentrations can be controlled by down-draft ventilation.

Other exposures.

Among other exposures noted was X-ray inspection under carefully controlled conditions.

Excessive heat was a problem to be met in certain operations in radio manufacture. Young women were employed on the basis of their greater ability to withstand the effects of high temperatures, though there is evidence that older women withstand fatigue somewhat better than young girls. Protective clothing was provided for the work, including goggles and asbestos gloves. Prevention of heat exhaustion should also include provision of salt tablets and cool water, to replace salt and moisture lost by the body in perspiration. Frequent relief,

[7] Schwartz, Louis, Medical Director, U. S. Public Health Service. Dermatitis from Cutting Oils. *In* Industrial Medicine, May 1942, pp. 228–233.

[8] Women's Bureau Bul. 184. The Occurrence and Prevention of Occupational Diseases Among Women, 1935 to 1938, pp. 87–89. 1941.

perhaps a brief rest hourly, from work in this room is advisable to prevent overfatigue.

The women employees themselves often complained of the hours of continuous standing, sometimes on concrete floors, or the backstrain from sitting all day on backless stools or chairs not adjustable to the individual. Other matters of complaint were the nerve strain resulting from the urging for greater and greater production; the monotony of certain machine operations; fatigue from lifting too much or lifting or holding material at awkward heights; local fatigue from continual use of a certain muscle group or from a peculiar position required by the work.

Some companies had taken steps to counteract the fatigue from strains of this sort. In one where jump presses required constant standing and jumping, the girl operators were given 10 minutes' rest in each hour of work. This company chose tall girls for jobs requiring reaching, to lessen the fatigue resulting from such work.

In many more instances rest periods should be introduced. They are especially necessary in monotonous jobs and jobs causing local muscle strain. Wherever introduced the result has been to increase production. Consideration should also be given to the well-known fact that the properly seated woman worker is a much more productive worker.

Women have been so successful in work with very small parts and in the fine close inspection work necessary throughout war industry, that eyestrain assumes an important health hazard to women war workers. One company devised a method of having the work done under magnifying glass. Necessary precautions include excellent lighting for the work, and provision of good-posture seating. It is especially important that every applicant for close work have a thorough eye examination. Necessary corrections should be made before taking employment.

PLANT CONDITIONS AND FACILITIES

To achieve good conditions of work, in all respects, in all departments, is a matter of no slight difficulty, but numerous plants in New Jersey rated high in its accomplishment. Of the physical conditions on which recommendations seemed called for, the ones most frequently open to criticism (see list on page 4) were those requiring equipment not easy to procure—washrooms, rest rooms, lunch facilities. Those discussed in the paragraphs immediately following were found seriously below standard in a comparatively small proportion of the plants.

Ventilation.

Ventilation was a problem in every type of industry, but it was more serious in some than in others. Heat and moisture were reported as excessive and overpowering in many departments of cotton and woolen mills and several employees attributed their repeated illnesses to this condition. Wraps hanging on wall pegs near humidifiers were very damp at the end of the day. Undue dust was reported in some grinding operations, and in ceramic plants also there was unusual exposure to powder and dust. In the use of rubber, in weld-

ing, in soldering there was exposure to fumes, and in a number of instances no really effective measures had been taken to reduce what amounted to hazards in various workrooms.

Lack of good ventilation in other industries was of a different character, as for example in clothing shops or where women were employed in simple bench assembly and inspecting jobs, as indicated by some of the reports:

Windows closed by new building on one side and work piled high in front of those on other side.
Windows do not open. No fans.
Basement workroom, terrifically hot, close, and damp. Few small windows above ground level. No way of heating in the winter.
Crowded loft room under tarred roof. Sun pours down on huge skylight which cannot be opened. No fans. A young floor girl busy here 10 hours a day, 7 days a week, lifting, folding, and carrying heavy bundles of army coats (10 to the bundle), becomes very tired but does not mind this so much as "the terrible heat, and then the odor of camphor is overpowering."

Conditions in some of the ceramic departments elicited many comments:

The dust is everywhere.
Powder makes the throat dry.
Many quit after working 1 or 2 days in the powder-filled air.
Girls from other departments refuse to be transferred here.
We suffocate if we wear those masks.
The heat from the ovens is terrific.
We asked for fans but never got them.
The girls near the ovens say they'll quit unless something is done about the heat.
Skylights, only one of which opened, were the only ventilation for fettlers working in the dust near the ovens.

Aisles and stairs.

Orderly arrangement of work and work tables is fundamental to the safety of workers. If crowded and cluttered, the value of wide aisles is reduced if not entirely lost, and danger lurks where floors are worn and slippery; yet neglect of such obvious hazards was indicated in several reports.

Aisles were narrow and crowded, floors were covered with litter.
Aisles jammed with goods.
Stairs between cutting and operating floors were steep, narrow, dark, no lights.
Floors rough, uneven, broken, and patched in spots.
Open unguarded window alongside stairs.

General safety.

As a whole the employers were safety conscious, but here and there careless disregard of some of the essentials was all too evident.

For instance, in an occasional workroom there were unguarded setscrews and belts and in some textile departments there was a maze of overhead shafting and belts. Added to this, many of the floors were oil-soaked and slippery and, as already described, aisles very narrow and congested.

One factory with a bad reputation for accidents was known in the neighborhood as the "slaughterhouse." Comments in the Women's Bureau agent's report read "aisles narrow," "stairs steep, narrow," "machines so close that operators crawl around and under them to

remove containers from back of machines," "some unguarded parts," "no cot, no nurse, first aid in charge of girl worker, sink dirty, bandages exposed on open shelves." Other bad conditions described were "no rest room," "toilets lacked privacy, as compartments had no doors."

Comments from other reports on first-aid provisions indicate conditions more or less typical in 8 firms.

No first-aid facilities.
Employees trained in first aid only persons responsible.
First aid in charge of 3 men only, though vast majority of plant are women.
Nurse on first shift, first-aid worker on second. No one on third shift.
No first-aid room or any place to put an ill or injured person except on a cut of cloth on the floor or on the table.
First aid in charge of girl worker who seems very careless about washing hands, sterilizing, and so forth. The cot is dirty.

In contrast were many descriptions of hospital rooms with modern therapeutic equipment, of clinics conducted for employees, of trained nurses in attendance 24 hours a day, and of preemployment physical examinations followed by regular check-ups.

"Suitable" clothing was the standard in most plants and uniforms of specified style and color were required in very few establishments. The occupations of well over two-thirds of the women employed as inspectors, bench hands, and so forth did not call for any special safety precautions in the matter of dress. However, the attention of 15 firms was directed to the very obvious need of safety caps in machine shops, goggles in some grinding occupations, and the danger of toeless and high-heel shoes.

Seats.

A seat should be available whether the job calls for sitting or for standing, in order that from time to time the worker may momentarily lessen the fatigue from remaining in the same position. It is a recognized fact that as fatigue increases, efficiency decreases, yet where the most strenuous work was being done by women, inspection reports read as follows:

No seats in weave room.
Only an occasional box in card room.
No seats whatever for mule and ring spinners, spoolers and winders.
Braiders stood as they watched their machines. No seats.
No seats in inlay department or sample room, tube department or packing department.
No seat available for examiners. Manager complained that girls don't last long on this job.

In other cases reports described inadequate seating, and while the work was less strenuous it was most exacting:

Twenty-five assemblers, crowded elbow to elbow, sat on a long bench at a table. When one moved it disturbed all the others.
Girls on assembly were seated on stools too high for work level and knees would not go under table.
There are boxes around and we can sit a moment if work is slack.
If the machines are running smoothly, we combtenders sometimes sit on one of the cans to eat for about 10 minutes while we keep an eye on the machine. Winders also sit on the cans.

Nurses in the textile plants referred to the unusual prevalence of varicose veins among the women, which they attributed in great part

to the constant standing or walking required by their jobs with very rarely a chance to sit down. The women themselves, who were largely middle-aged or older, often discussed it. "Young girls quit; they can't stand it, the heat, the dampness, the aches."

Job strains.

For the most part work was light and did not require much physical strength, but there were exceptions where a little consideration of easing the job would have decreased fatigue immeasurably. For example, in one factory the agent pointed out that short workers obviously were having difficulty straining to reach parts of the machine. The foreman replied that he always asked for tall girls for those machines but that was all the good it did.

A few women were operating heavy "kick presses" and "jump presses." In one department where the operators were on a production bonus it was the firm's policy to hire only young women for this job, as they considered it too hard for older ones. An operator only about 20 years old already had varicose veins. She said that jumping two to three times on the treadle at each operation was a great strain on feet and back.

Another whose work required continuous standing and lifting a tray weighing about 25 pounds every 2½ minutes commented, "This is a woman's job all right, all work and no pay." (Her average piece-work earnings were about 55 cents an hour.)

In one plant huge pieces of fabric were spread on the floor for the cementing of the seams. The workers had to stoop over on their knees or squat on the floor and slide along as they worked. Every interviewed woman employed here, whether hers was a cementing job or not, commented on the work.

> It is very hard on hands and knees.
> I can use the money but I'm tired, I'm always tired.
> The company hires cheap engineers. We work with a cement that gags us.
> Fumes from cement make you drunk.
> It takes strength; you have to be extra husky to stand it.
> The benzol makes us faint sometimes.
> Only those who need the work stay.
> Many come and leave. They get sick from the fumes.
> I used to be polite and ask off, now I stay off.

Very different from the physical exertion required in the heavier jobs was the boring monotony described by a girl in a mending department: "I sit all day and look and look. Most of us wear glasses"; or by the woman who worked as an inspector 9 to 10 hours a day and who commented, "It takes it out of you. You wear your nerves down and it makes you irritable."

A rest period to ease the eyes, a seat for occasional relief from the fatigue of continuous standing, or a simple change in the job operation to lessen the weight and reach would have reduced fatigue and strain in practically all cases.

Service facilities.[9]

In most cases management realized that with the rapidly expanding force of women there was increasing need of adequate service facilities,

[9] For lunch facilities see pp. 20–24.

often difficult to obtain under priority regulations. In anticipating this expansion many had foreseen the difficulties of coping with the situation of limited supplies and so were ready when expansion came. In other places toilets and washrooms were inadequate to the point of congestion, making it doubly difficult to maintain a satisfactory standard of cleanliness of lavatories and an adequate towel supply. Since most women are more affected than men are by dirty, dark, badly ventilated, and disorderly surroundings, it is important that workrooms and all service facilities be kept at least decently clean.

In 38 plants washrooms were crowded, cluttered, and indescribably dirty, and in 10 plants the employment of matrons was recommended to have the sole responsibility of maintaining high standards of cleanliness and to see that the women employees made the best use of the facilities. Other suggestions made were for providing lights in dark toilet compartments and doors for toilet units in a few mills and factories so as to secure privacy. Where roughly improvised toilet rooms had been constructed in workrooms, with partitions reaching only part way to the ceiling, measures were suggested for completely inclosing such rooms and providing for ventilation other than through the workrooms.

Drinking-water facilities were noted as inadequate in some plants; in one the only bubbler was located at the entrance to the men's room. It was of the insanitary type, with a vertical jet falling back on the orifice, and the flow of water was so low as to be almost nil at times. In another instance there was but one fountain for the entire plant, employing a few hundred, and there was no water supply whatever on the balcony where many worked.

Rest-room conveniences were entirely lacking in a number of factories and in others they were wholly inadequate. Some of the inspection reports on rest rooms read "only benches," "no easy chair," "not a cot in the plant," "guide explained that if a girl isn't well she can lie on a pile of goods (fabric material) on the floor," "in case of illness stretch out on bench." Dressing rooms too needed attention in some places; for example, the one in a textile mill supposed to accommodate 200 women of which the agent reported, "Only 4 lockers and a few wall hooks in very cramped quarters." In contrast the dressing room in another plant is described as "ample, clean, and well kept."

ABSENCE AND TURN-OVER

Among the topics covered in the plant interviews were absence and turn-over, and it was apparent that the "uneasiness" of the times, coupled with increased difficulties of adjustment to longer work hours and other plant conditions, was reflected in some increase in absences and quits. Expanding employment in many industries gave ample opportunity for job hunting, and when one considers the unfavorable conditions under which many employees were working it is not surprising that they were trying to better themselves.

Amazingly few firms had made any analysis of causes of absenteeism or turn-over or had definite records showing the rates in either case. Most were inclined to dismiss the subject with generalizations. Of turn-over they said, "practically none," "too small to reckon," "very low," "fairly stable," "about average"; or on the other hand turn-

over was reported as "increasing," "higher recently," "very great," "fairly heavy," "losing our best workers," "terrific, for the young don't take their work seriously."

Of the 121 firms that made some statement about turn-over, 95 reported it as "low" or showing "no increase." In other words, it was "no problem," but for the other 26 firms it was increasing and in a few cases badly out of control.

Firms seemed less aware of the problems of absenteeism than of turn-over, and only 90 made any generalizations about it. Of these, 64 said it was "normal," "not noticeable," "nothing to complain of," "no alarming increase," "generally excellent." Twenty-six reported the opposite picture, saying it was "increasing", "becoming a problem," "bad on Monday," "fair but too many off on Saturday," "higher since hiring women." The 26 firms reporting turn-over as a problem were not in all cases those that reported absenteeism as high.

Almost without exception, in those plants where the general impression of management was that turn-over and absenteeism were high, explanation for much of this could be found in work conditions as disclosed either in reports of the factory visit or in interviews with the employees such as have been listed in the preceding pages.

For instance, in a factory where the manager reported turn-over as "terrific," 60 cents an hour was reported as the usual maximum earnings for experienced workers in power sewing and electric fabric cutting.

Another owner said, "Whenever Company X advertises for girls, we can count on losing a lot of ours the next day." Every girl interviewed from this firm was critical of the wages. After working here 2 years, carrying bundles, turning collars, and so on, a floor girl still was earning 40 cents an hour. Others on more skilled operations, as pocket and collar setting, were averaging around $25 to $30 a week.

Turn-over was reported as "fairly heavy" by a long-established firm that had expanded considerably for war work. That it was "fairly heavy" was very easy to believe, for of the employees visited, all of whom were selected by the firm, few had been with the company as long as a year. The employment of the others had been limited to a few weeks or months.

The firm's beginning rate was 40 cents an hour and the women's usual rate was 50 cents; a supervisor was earning 55 cents an hour, but this included the special bonus for work on the second shift. The following are some comments made by the employees. They give further indication of why the turn-over was high:

> Girls complain more about wages than anything else. They leave after getting experience because then they can make more in other places.
> After a few months the new girls make the same as older employees.
> We're not complaining of the hours; we have to work all 7 days to make any money. (Work schedule called for 7 days a week.)

Another small clothing manufacturer said he had 50 replacements a month. The report of the Women's Bureau agent who visited his plant, as well as comments of his workers, none of whom had been employed there over 6 months and all of whom had been recommended by the owner for interviews, pointed to conditions which might well have been the cause of his turn-over troubles. They reported a steady grind of 53 hours a week under driving pressure to finish heavy

army coats. Pressers were working under the handicap of antiquated equipment in bad repair and there was no means of escape from the excessive steam and heat which sewing-machine operators working alongside the pressers found unbearable. Sanitary arrangements were limited and roller towels were changed only twice a week.

In summing up the situation in one factory a woman remarked: "This factory is not a sweatshop, but one or two foremen who are trying to make a record for themselves bring undue pressure for production. Mr. ——— is one of the finest employers you would want to have, but the people he hires for bosses are not so good and the girls won't put up with them."

Management had made a few efforts to improve high turn-over with more or less success. One said it was "lower since the second shift was abandoned," employees here being chiefly young women on sewing operations. But the most outstanding example in reducing turn-over was made by a firm reporting that it had been "terrible" for the past year but had decreased noticeably with a recent increase of 50 percent in the wage scale.

One company that in converting to war products had lengthened its hours to 10 a day and 54 a week reported the increase in absences as "noticeable and serious." Management attributed it to the longer hours.

> This year has opened up a picture that is new with the longer hours. Many employees simply cannot work the 10-hour day for any period of time. At present a large number of people are employed who are not physically able to cope with the long hours and the increased rate of production. Saturday absences may be due to an accumulation of weariness from the long days.

This company also attributed some of its turn-over to a general spirit of restlessness that was evident everywhere.

No understanding of absenteeism is possible without some information relative to women's home jobs of housekeeping and homemaking. For this reason, among the questions asked the women interviewed was whether or not they carried the major part of the housekeeping load. Of the married and widowed group slightly less than three-fifths had young children. Many said they had help with the washing, or a relative did the shopping, or a daughter did many of the chores. In fact, others helped to such an extent that many reported they "shared" the household cares rather than carried the major responsibility. Occasionally a woman had "paid help once in a while. I couldn't do my job unless I had some help." However, two-fifths of all the women living at home carried the major load with little or no assistance from others, and about three-fourths of the mothers, not a few of whom had as many as 3, 4, or 5 children, had this heavy responsibility in addition to the factory job. A mother of 3, ages 11, 12, and 14, herself a widow who worked 8 hours a day and 6 days a week, said she had "everything to do—cooking, cleaning, sewing—work all the time—never time to rest." Single girls also had home responsibilities, as in the case of a young woman who was keeping house for her father and brother. She was getting the supper when agent called on her, at 7 o'clock, after she had worked a 10-hour day in the factory. As she described her cares, tears came to her eyes. "No kidding, I'm so tired sometimes I don't know whether I'm coming or going." She cleans and bakes nights and Sundays. "I

don't have any time to go out." Then with more enthusiasm she spoke of her factory job: "It is a good place to work; it is the easiest work I ever had." (She had done housework and laundry work previously.) "My job never makes me tired. I can get out my quota easily."

In one or two firms overworked personnel directors suggested that the Women's Bureau agents visit some of their chronic absentees. Among these and others interviewed were women of all ages, with long and short work histories in various industries. Most of them had heavy duties at home, a condition perhaps contributing as much as the physical requirements of the factory job to the lowered energy and fatigue of which so many complained. The story of one of them is typical of many of the others. In this case a mother of two children aged 5 and 7 had managed to work 2 years in the factory that fortunately for her was within walking distance of her home. Her main problem was securing adequate care for the children 6 days a week and 7 days when she worked Sundays. She explained further that she could make better arrangements if she could "work steady on the day shift," for she was rotating weekly on a work schedule from 7 a. m. to 3:30 p. m. to one from 3:30 p. m. to 12 midnight. Her husband was away from home most of the time and a niece, a high-school girl, and also a brother of 16 years had been "coming to help out." Even when she was on the first shift it was impossible to depend on the day nursery, as it did not open until 8 in the morning. One of her final comments was, "I may have to give up my job."

Another worry of the mothers was the lack of permanency in the arrangements they could make for child care. Even when home affairs were running smoothly, past experience had taught them how temporary the present program might be and how suddenly and without warning it might collapse.

In an effort to overcome the irregular attendance of the work force a number of firms had resorted to punitive measures, some so extreme that they might easily increase rather than decrease the instability. Such was the policy of discharging employees if absent except for illness, reported by a few companies. The policy of others was to remove names from the pay roll after very short absences, necessitating the routine of reinstatement upon return to work and occasionally entailing a physical check-up by plant medical departments.

More effective measures were in use elsewhere. In several firms that realized that illness is the cause of much absence, plant nurses called at the homes of those reported ill, and it was also customary on the worker's return to report to the medical department. Following this policy of investigating each absence, many had effected a marked improvement. The most outstanding change was reported by a large firm employing hundreds that reduced absences by as much as 80 percent by this method.

The interviews do not indicate to what extent transportation was a problem, as addresses for home visits were selected when possible with a view of economizing the time and effort of the visitor. In consequence, over two-fifths of the workers visited lived within walking distance of the factory, but records of others showed the workdays lengthened at each end by interminable car rides and several transfers.

MORALE

Naturally, the employees were more happily adjusted to the work in some establishments than in others. Judging from the attitude of the workers visited, the morale was very low in some 20 plants. The women from these plants seemed to be unaware of the importance of their jobs to the war effort; they had no enthusiasm for their work and were lacking in respect and loyalty to their firms. Though this extreme indifference was not true of any great number of companies, employees in at least one-third of all the plants had no conception of their job responsibilities; theirs was merely work to be done and they would do it. On the other hand there could be no doubt about the importance of the war effort in the minds of many girls like the one who, after discussing the fatigue resulting from the 9½-hour day on 6 days a week, added eagerly, "But they don't push us and they're so good to us that we're glad to work like that. I would like my Saturdays free but during these times we're all pulling."

As always, there were clashes between personalities. If the difficult person was not the foreman, it was some other of the "bosses."

> Some of the bosses holler and talk to the girls like dogs.
> Too many bosses put us on edge.
> Mechanics do not keep the drills sharp, especially at night.
> Not enough supervisors. (By inspectors not sure what "to pass" and what "to throw out." Apparently the tendency was to approve when in doubt.)

An analysis of the standards and policies in the 20 plants with the lowest morale among the workers explained in many cases the unhappy adjustments and this all too evident lack of interest and loyalty. Not all the gains from good ventilation, cleanliness, and adequate service arrangements can be measured directly in terms of production. To illustrate the relation between bad plant conditions and low plant morale, case histories of four plants follow. All represent admittedly extreme situations and are not typical of the group, but they do indicate how great an effort some concerns must make before their employee attitudes can be changed. Use has been made of both plant-inspection reports and employee interviews.

Plant 1.

Hundreds of women were employed here; in fact, women constituted about two-thirds of the working force. Their occupations were chiefly assembling and inspecting small parts, many infinitesimally small yet vital to the war effort. Nothing could be more "awfully tiresome," more "monotonous and deadening." Those of the workers who were interviewed represent a cross-section of the group and various occupations in all parts of the building. The interviews described the girls who supplied the information as conservative, cautious, fair, reluctant, refined, and only one as aggressive.

The many repetitions in their statements showed agreement not only among the women workers themselves but with the report of the Women's Bureau agent who went through the factory. The low state of morale in the plant undoubtedly was due in large part to the physical conditions throughout the factory. Though complaints were made about wages, which ran around $17, $18, and $20, adjectives sometimes failed the women in attempting to describe their shop environment.

The briefed comments that follow suggest only mildly the actual conditions:

1. From agent's report.

Definite need of paint and repair. Floors unnecessarily filthy from dirt and grease. Toilets inadequate in number and filthy. Cafeteria dirty, dingy. No rest room. Very inadequate cloakroom; nails and hangers in compartment adjoining only 1 of the 5 toilet rooms. Plant unusually hot. Nurse's report shows that many faint from extreme heat.

2. From interviews with women employed.

General repair and housekeeping

The roof leaks in many places and the floors are a mess.
You should see us fly to pull the work around when it rains.
Rats as big as cats run around the workroom and roaches crawl up the walls.
The company rents the building and it has not had much repair for 30 years.
There just doesn't seem to be anybody there to keep things nice.
The whole place is run down.

Ventilation

Nothing to blow out the air. Small windows on one side and only a few will open.
The heat was terrible. I work next to the ovens. (Had fainted.)
It is hot to work there. A fan is brought back and forth; sometimes we have it and sometimes we don't. It doesn't belong to us.
The taste of paint is in your throat all the time. (One of the few spray painters. Solderers also complained of fumes.)

Toilets and washrooms

They are too dirty to talk about.
The floor is cleaned once a week and most of the time it is terrible.
Half of them don't flush.
Wash bowls don't drain well.
The doors are broken and don't fasten.
Clean sometimes and sometimes it isn't.
Present carelessness of girls due to spirit of revenge for lack of nicer facilities.

Cloak rooms

You put your coat where you find a place to hook it up.
Hang coat on the pile; not room for all. Can only get a hanger when you duck one so the others can't find it.
No place to put anything.

Rest room

There is not a chair in the place. If a girl feels sick there is no place to put her.
I hear that some places have nice rooms with lockers, chairs, and magazines.
There is not a chair in the washroom except a three-legged one that throws you.

Cafeteria

It is too dirty for people to eat in. The roaches and birds keep it dirty.
Too many cockroaches, rats, and birds.

Drinking water

There are bubbler fountains but the flow of water is irregular and sometimes barely comes over the mouth of the fountain.

Plant 2.

In another plant, relations between management and labor had been strained almost to the breaking point, but on talking with some of the women employed it was not difficult to discover the causes. In this case also the company cooperated in furnishing names and addresses of employees, and the Women's Bureau, at the request of the company, summarized for it the outstanding comments covered in the home interviews, of course without identification of employees.

Most of the women interviewed, aware of the delicate relations, were reserved in their comments. None were emotional, yet it was apparent that failure in the past to recognize the importance of human relations had left resentment. Few women realized the importance of their jobs to the war effort and, except in a very general way, they did not know the ultimate use of the small parts on which they were working. Their attitude was, "It is cheap stuff. It doesn't matter how many we break." Ignorance of elements used in the composition of the material made it a mysterious evil, a something to be feared and a something much discussed by the employees. It was variously reported by several to have been the cause of bad coughs, of sinus, throat, and eye infections as well as skin rashes, yet little had been done to dispel their fears or to control the hazard, which management claimed was imaginary.

Management agreed that criticism of the inadequacy of job training was well founded, as was that of idle equipment and the very low staffing of the second and third shifts. Under these circumstances, the employees argued, it was no worse for a worker to be absent than for machines to stand motionless. Their references to absences and quitting the job were most frank. The 7-day week coupled with home responsibilities accounted for much of the absenteeism. The 7-day week had been exhausting, and though the work schedule had recently been reduced to a 6-day week they found that it still was necessary to take a day off now and then to keep up with even a limited amount of household duties. The women volunteered the information that, as an absence report was required on return to work, they customarily said their absence was due to illness, regardless of the actual cause.

The workers' repeated references to "wooden benches," "crowded toilet rooms," "no lunchroom," "no rest room" indicated the need of improved plant facilities. Almost all those interviewed referred to the ventilation, complaining not only of the "cold in winter and heat in summer" and "the floors over the ovens too hot to stand on," but "the gas fumes that make us faint; they had to stretch out a dozen of us at once on the grass." Management was said to be working on the problem of fumes but it was a condition of long standing.

Here too, as elsewhere, wages were a cause of much ill feeling. The plant had earned a reputation of paying low wages in the past and had much to live down. Management was aware of the fact that frequently green girls came here to gain machine experience and left for better pay elsewhere as experienced operators.

Plant 3.

Excerpts from the agent's report on another plant in the low-morale group indicate especially bad working conditions. "Inadequate means of ventilation. Women have left because they could not stand the

strong fumes from the synthetic rubber with which they worked. Not a seat in some departments. Stools in others, but not adequate. No lunchroom and no provision for food. No dressing room but nails in wall of toilet room 12 inches too high to reach conveniently. No place for shoes. Room disorderly. No space set aside for first aid." But the women workers who were interviewed from this factory stressed chiefly the fatigue, strains, and hazards of their jobs. It is noteworthy that though in practically all plants employees were glad to work overtime for the extra money, in this instance where there was no overtime they expressed relief that the workweek was not longer than 40 hours as their jobs were so very tiring. They had no desire to work overtime in spite of its extra compensation. "I would rather have Saturday free even though I lose the extra overtime money. I get very tired."

They referred to the strain of holding the arms at head level to work. Others had a strenuous and disagreeable job winding canvas from heavy rolls very tightly around large frames and then applying a liquid rubber coating. It was necessary to work in a team of two in order to pass the canvas roll back and forth securely. Everything they moved or handled became smeared with rubber, that ruined coveralls and shoes. To get hot water for washing, the girls carried it in buckets from the boiler room. To cap the climax, the production rate had been doubled but at the same time the piece rate had been cut.

Plant 4.

In a plant that had recently converted to war work making very small metal parts, management was much disturbed because their younger women employees were constantly "job shopping" and other firms were pirating their labor by offering better jobs at better pay. They said that girls were absent more now than when they had been on civilian production and that they did not work so hard as they had done in peacetime. They complained that their labor troubles were almost beyond control, and that the grievances usually involved the women and seldom the men. Incidentally, the men as a whole were an older, skilled, and experienced group of workers, holding the key jobs, while the women constituted over two-thirds of the force and were decidedly young, with little or no work experience.

The director of personnel attributed the increasing absences to the fact that the women were making more money now and could afford to take a day off.

But most revealing were the comments of the women whose names and addresses were furnished by the company. The matter of wages was a sore point with them, in spite of the fact that within the year the starting rate had been raised from 35 to 45 cents and most women were now on the 45-cent rate. Further, through recent union negotiations, when girls had been with the firm a year they received an increase from their former 40-cent rate to 50 cents; but girls longer with the firm had not fared correspondingly well. One woman, after 7 years of service, was earning 54½ cents an hour. All realized that many plants had higher wage scales and felt that there was little chance of advancement in the job or wages here.

Another reason why many did not stay was the nature of the work. Those with experience described the starting job as monotonous and

tedious. "The girls don't like the job. It is constant hand rubbin and often irritates the skin." An older woman commented, "If the would stay long enough they'd get used to it."

The plant was operating a 10-hour day and 54-hour week, exclusi of a break at noon of half an hour. A rivet-machine operator complained that it became very fatiguing and she had noted a definite lag in her production toward the end of the day. Another young woman who found the overtime too much felt that the overtime pay could never compensate for the increased fatigue. Other vexing little annoyances were complained of. The women felt that they were "being watched constantly," and as an example of policing they cited the locking of toilet rooms and the need of signing for the key. The girls objected to being "bawled out" if away from the work bench more than 5 minutes. They insisted that management discouraged their washing up even when they did it after the quitting hour on their own time. Though seemingly trivial matters, such things as these point to beginnings of maladjustments that may lead to real issues. Nothing could be worse for morale and efficient production.

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1/6/44

(13) FOUNDRIES

No.	Name	Location	Product	Employment			
				Total		Factory	
				Total	Women	Total	Women
1	American Chain & Cable Co.	York, Pennsylvania	(1) Wright-Manley Div.: hoists of all types, motor vehicle maintce. equipment, other ordnance material. (2) E.W.Chain Div.: truck chains, two chains, other welded & weldless chain assembly. (3) Malleable Foundry: malleable castings. (Only dept. used in "Foundries.")				
	11/43 Frances Harnish						
2	Textile Machine Works	Reading, Pennsylvania	Makes Army Range Finders (precision work), fittings & castings for the Navy. Production of 1.1" gun parts, 3" and 5" fuse setters and fire control mechanism (90%): Knitting Machine Mfg. now only 10%. Subcontracts for Mack Motor Co. for Truck Parts also. Firm sublets some lathe and milling machine work because of its lack of enough machine tools for this. Some of its machines, special adaptations for making of knitting machines, have been pushed to one side, awaiting peace-time production.				
	12/9/43 Harnish						
3	General Steel Castings Corp.	Granite City, Illinois	Turrets and locomotive castings. Very few turret castings are being made at present. Practically all government orders are for locomotive castings because of critical transportation needs. This company makes the largest castings in the U.S. The entire locomotive section is cast in one piece. The core room in this plant is 8 blocks long and is second largest in the world.				
	8/18/43 Elsie Wolfe						
	E. Wolfe						
4	Americal Steel Foundries	Granite City, Illinois	Turrets for tanks and gun carriages.				
	8/17/43						
6	American Chain & Cable Co.	Reading, Pennsylvania	Make steel castings (27%), Steel Valves and Fittings (48%) Iron Valves (9%), and Brass castings and Bar Stock (19%).				
	12/10/43 Harnish						

No.	Name	Location	Product	Employment			
				Total		Factory	
				Total	Women	Total	Women
20	The Landis Tool Company	Waynesboro, Pennsylvania	Cylindrical grinding machines Make almost all kinds of grinders (except surface grinders) and only grinders.				
11/18/43 Harnish							
19	Doehler Die Casting Co.	Pottstown, Pennsylvania	Highly complex production of dies, and aluminum and zinc alloy die-castings, comprising 3,500 different parts for: Army and Navy Ammunition Components, Aircraft Components; Tank Components, and Maritime and Chemical Warfare Components. Esp. make component parts for 20mm anti-aircraft shells, grenades and aerial bombs.				
12/14/43 Harnish							
26	Otis Elevator Company	Buffalo, New York	Machined castings, such as turret rings for Martin bombers. Gun mounts cast, machined and assembled. Parts for elevators on airplane carriers. Leveling sockets for guns. Jobbing castings.				
9/29/43 M.M. Wright							
27	Allegheny Ludlum Corp.	Buffalo, New York	Castings of steel alloy which are shipped to fabricators. Largely a jobbing foundry but turbo superchargers used eventually by the navy are on a production basis. Will be sole producer of certain parts for equipment for making penecillin, the new drug.				
9/27/43 M.M. Wright							
28	Continental Roll & Steel Foundry	E. Chicago, Indiana	Armor tank castings (tank hulls weighing 10,000 lbs., sometimes get out 6 in a day); some of normal times products; and large miscellaneous castings (some weigh 78 tons).				
10/1/43 M. Bagwell							
35	American Steel Foundries, Hammond Works	East Chicago, Indiana	Cast armor for tanks - castings for tank hulls, housings, and some smaller parts.				
10/16/43 M. Bagwell							
38	National Malleable Steel Castings Co.	Cicero, Illinois	Steel castings & malleable iron castings - parts for army trucks, tanks, and parts for torpedo boats for Navy.				
10/22/43 M. Bagwell							

No.	Name	Location	Product	Employment			
				Total		Factory	
				Total	Women	Total	Women
39	Birdsboro Steel Foundry & Machine Company	Birdsboro, Pennsylvania	Make steel castings, principally for U.S. Navy, Maritime Commission, and Shipbuilders. Make Hydraulic Presses, principally for aircraft builders. Make Rolling Mill Machinery for Steel Plants. Make Iron Castings for Machine Tool Builders. All job work, no mass production, every job is different. Make steel castings and very large ones- 1 ton to 100 ton castings. Do not like to take orders here for castings of less than 60 lbs., and sublet the small castings jobs.				

12/5/43 Harrisburg

Summary - Living Needs of Women Employed in Artillery Ammn.

CONFIDENTIAL

LERY AMMUNITION PLANT INFORMATION AS RELATED
LIVING NEEDS OF WOMEN WAR WORKERS

Plants Visited in 1941 & 1942.

ion plants and a few Army Depots were visited in the tabulation. Practically all of these plants are new and most are situated in predominantly rural areas, at least five to fifteen miles from the nearest town. In a few instances one medium sized city is in the vicinity.

Although some ordnance plants employing women only for office work were visited, detailed information was obtained mainly for those plants where women are, or will be, employed on productive operations. Of the plants using women on production, only three expect to employ less than 3,000 workers at the peak. Four will probably employ 3,000 to 5,000, and four others will employ between 5,000 and 10,000. Seven plants expect to employ over ten thousand people, and officials of several of these estimated that total employment may go as high as fifteen or twenty thousand, and in a few cases even higher. Figures were obtained from practically all firms concerning the numbers of men and women employed at the time visits were made and concerning the estimated numbers necessary for peak production, but these data were obtained with the understanding that they would be held in the strictest confidence. Therefore, only the proportion of women to be employed at peak production have been shown by plant.

It must be recognized that in many instances the majority of a plant's workers are still commuting from a radius of 35 to 50 miles by private cars. Therefore the transportation problem may eventually become very serious in certain places, and if this problem cannot be solved, more housing of many types will be needed.

The minimum age limit for women in most of the plants is 18, although a few have limits of 20 or 21. Only a few definite maximum age limits were reported, but physical requirements, maximum weight restrictions (found in one

CONFIDENTIAL

SUMMARY OF ARTILLERY AMMUNITION PLANT INFORMATION AS RELATED TO LIVING NEEDS OF WOMEN WAR WORKERS

Plants Visited in 1941 & 1942.

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The minimum age limit for women in most of the plants is 18, although a few have limits of 20 or 21. Only a few definite maximum age limits were reported, but physical requirements, maximum weight restrictions (found in one

or two plants), and preferences of some employers, tend to make younger women predominate in these plants at present. There are no restrictions against married women. In fact most officials guessed that half or more of the women who have already been hired are married. However, it seems probable that in places where in-migration occurs to any extent, the proportion of single women will increase.

With a few exceptions, there has been no marked tendency yet to hire Negroes on productive operations, but a considerably larger supply of local labor may become available in a good many areas if this practice comes into general use.

While the emphasis has been placed in this summary on the productive or plant workers, probably it is frequently true that a higher proportion of office workers than factory workers are single women who come from beyond the commuting area. Also, of course, there are some women office workers, recruited through Civil Service, who are employed by the Army and Navy at all of the privately operated plants, [illegible] plants.

The tabulation which follows indicates the areas in which additional housing for unattached women will very probably be needed and also the areas in which additional facilities for food, recreation, and transportation would provide for the most paramount needs.

Areas and Plants Visited	Women Labor Needs 1/	Sources of Women Labor Supply	Comments Concerning Living Need
Maryland - Elkton (Triumph Explosives) (National Fireworks) Visited Nov., 1941. Revisit to area in Feb., 1942, and to the dormitories on April 30, 1942.	Both companies planned to use about 65% women in their labor forces even prior to the declaration of war. Several thousand women needed for peak production. At least one plant still planning to expand considerably at end of April.	First workers were drawn from the commuting area but very early one plant had to get workers from distances of as much as 60 miles. Both companies are now recruiting workers from mining regions of Pennsylvania and other places beyond the commuting area.	Dormitories to accommodate 179 women were opened March 23d and have been practically filled during all of April. Sixteen more units to be built. A private individual is planning to open a cafeteria on the grounds. Since eating facilities in Elkton are meagre and none are near the dormitory project, this cafeteria should be considered essential.
Virginia Dublin-Radford-Pulaski (New River Ordnance and Hercules Powder Plant) 1st Visit - Nov., 1941. 2nd Visit - Mar., 1942.	Powder Company at Radford using women in office only at time of first visit. New River Plant reported at time of second visit that peak employment of women had been reached on operations on which they have thus far been employed. Since second visit to area, report received that some women from New River Plant have been transferred to the Radford plant. It is possible that women may be used on some additional operations at the bag loading plant if the supply of men becomes exhausted.	Numerous reports indicate that a good many workers have been commuting long distances. Quite a number from Roanoke approximately 60 miles away which requires several hours of travel each day.	Two of eight dormitories for women open at time of second visit but only a few women were in residence. Isolated character of the site on which these dormitories are located is undoubtedly a handicap even though a recreation wing has been provided. Investigation should be made to see what additional transportation and other facilities need to be provided.

1/ Figures concerning the number of men and women employed and estimates regarding peak employment obtained from practically all firms on a strictly confidential basis.

Areas and Plants Visited	Women Labor Needs 1/	Sources of Women Labor Supply	Comments Concerning Living Needs
Ohio - Ravenna (Ravenna Ordnance) Visited April 3, 1942.	Women only employed to any extent within past month. However, at peak production Company expects to employ 40 percent women out of many thousands of workers. This is one of the largest plants visited.	Attempt has been made to get labor from within commuting area and near-by cities, such as Akron. However, plant and employment service officials agreed that there is a definite labor shortage in Northern Ohio and that labor will have to be imported from Southern Ohio, Kentucky, etc. Women, as well as men, already coming into the area from many places.	Dormitories for 450 to 500 women already built and additional buildings for about the same number to be constructed at the plant. Slightly more than 40 women in the dormitories at time of visit. A much better transportation system is needed. Present eating facilities near the dormitories are inadequate. Some type of recreational facilities should be provided for women's dormitories to be built at the plant.
Indiana - Charlestown-Jeffersonville (Hoosier Ordnance Indiana Ordnance Jeffersonville Quartermaster's Depot Visited December, 1941.	About 80% of a very large force at Hoosier Ordnance will be women. The Depot is employing many hundreds office women and over 100 in production, and will expand. Indiana Ordnance employs no women in production.	All labor generally being hired within radius of 50 miles. Definite indications that about half of the workers coming from Louisville.	Because of the proximity of these plants to Louisville more workers can commute. Adequate transportation is necessary.
LaPorte-Kingsbury (Kingsbury Ordnance) Visited December, 1941. Revisited April 30, 1942.	At time of second visit company employing 50% women out of many thousands. Further expansion is planned and women will probably constitute 60% of eventual labor force, the largest number to be employed in any shell loading plant.	On first visit company hoped to be able to recruit most of labor from within the State of Indiana and nearby parts of other States. Some people still commuting very long distances at time of second visit. Labor within commuting area insufficient. Women now living in dormitories have come from as far as Cleveland, Detroit, Grand Rapids.	Only 63 women in dormitories to accommodate 227. Eating facilities adjacent to the dormitories are very badly needed. Since more dormitories and a very large housing project already planned or under construction, no additional housing program necessary now.

Areas and Plants Visited	Women Labor Needs 1/	Sources of Woman Labor Supply	Comments Concerning Living Needs
Indiana (cont.) - Burns City (East Coast Ordnance) Visited January, 1942.	Probably not more than 400 to 500 women will be needed at peak production.	Even though all positions under Civil Service, plant trying to get labor from within 50 miles.	Because of isolated character of this plant, women would probably prefer to live in Bedford or Bloomington and commute. But these towns are 25 to 30 miles away and if transportation cannot be provided, then housing for women will be needed at the plant site. Some recreation facilities would also be needed then, although the plant cafeteria could be used for meals.
Illinois - Joliet-Wilmington (Elwood Ordnance Kankakee Ordnance) Visited January, 1942.	Elwood will employ many thousands, of which about 35% are expected to be women. Kankakee Ordnance employing on office women - a relatively small number.	At time of visit most women were coming from within the commuting area and there was uncertainty as to the source of future supply. Probably some women will have to be imported.	Housing needs of women uncertain at time of visit but dormitories may be needed eventually. Close watch should be kept on the situation.
Marion-Herrin-Crab Orchard Lake (Illinois Ordnance) Visited January, 1942.	Company was not expecting to begin operations before late spring of 1942. About 40% of peak labor force is expected to be women.	Many young unemployed workers available. Area has been "depressed" for many years. It is unlikely that unskilled labor will have to be imported.	Much existing housing undoubtedly poor, but women can probably continue to live in places in which they have been residing.
Iowa - Burlington (Iowa Ordnance) Visited February, 1942. Revisited April, 1942.	Because of type of work done in this plant, women will not constitute more than about 30% of maximum force, but several thousand women will be needed.	Most women coming from within the commuting area. Some wives of migratory men workers have also been employed.	Local persons interviewed did not indicate any need has been felt for dormitories or other types of housing for single women.

ns and Plants Visited	Women Labor Needs 1/	Degree of Women Labor Supply	Comments Concerning Living Needs
Tennessee - Jackson-Milan-Humboldt (Wolfe Creek Ordnance) Visited February, 1942.	Company expects to reach peak production by end of summer of 1942 and estimates about 60% of labor force of many thousands will be women.	According to reports women needed for production can be hired from within the commuting area.	Company converting a dormitory on the reservation into accommodations for 160 women. Expected to be ready early in March. Eating and recreation facilities are available near the dormitories. Careful attention should be given to the degree of popularity which these dormitories achieve, since it may indicate whether women are willing to live on ordnance plant grounds.
Alabama - Talladega-Sylacauga-Childersburg (Coosa River Ordnance) (Alabama Ordnance) Visited March, 1942.	Alabama Ordnance expects to employ women only for office work; 60 to 70 per-cent of total labor force at Coosa River Plant will be women at peak production. Company hiring at a rapid rate.	Most of office workers for operating company and Army at Alabama Ordnance commuting from Birmingham. A round trip consumes about 3 hours per day. Army concerned about increase in rate of turnover in recent months. Coosa River hiring mainly women from rural areas sur-rounding the plant but employment official believes local supply of labor insufficient for peak production. Also transportation problem is very serious because workers are now coming from scattered farms and villages.	Indication housing for single women will be needed soon, probably both at Sylacauga, which would be a more desirable place than Childersburg, for office workers at Alabama Ordnance Works, and at Talladega for the Coosa River plant. However, some plant officials hope that some women may be able to rent rooms from families in Talladega housing project when it opens.
Huntsville (Huntsville Arsenal) (Redstone Ordnance) Visited March, 1942.	One plant is barely started on production and the other hoping to begin during April. Number of women will be small in the beginning but proportion of women employees expected to increase considerably at Redstone Ordnance. Maximum expansion will probably be 40% out of several thousand workers. A few hundred women may eventually work on production at Huntsville Arsenal.	Probably most women can be obtained from surrounding towns for the immediate future, if more transportation is made available.	Chamber of Commerce reported supply of rooms exhausted and was advertising for rooms to rent. Family housing projects being built may relieve some of the pressure. There is some community interest in dormitories.

Areas and Plants Visited	Woman Labor Needs 1/	Sources of Woman Labor Supply	Comments Concerning Living Needs
Georgia - Macon (Naval Fuse Loading Plant) Visited March, 1942.	At least several thousands will be employed and 80% to 90% will be women.	Macon is a larger city than most of those near these plants, but a number of women reported to be commuting from outlying towns. Some women very probably going to be imported even from areas of Georgia beyond commuting distance.	Not many women have been seeking rooms in Macon as yet but the plant has been in operation for only a few months. There has been some local discussion concerning the possibility of defense houses being opened to small groups of single women since only 50 out of 250 in one project had been rented to family groups.
Mississippi - Jackson-Flora (Mississippi Ordnance Plant) Visited March, 1942	Plant not yet operating but probably will begin in May. One-half of the total labor force will be women, but apparently expansion to peak production will extend over a considerable Period of time.	Woman labor can be drawn from Jackson and surrounding rural area at the beginning. Over half of the population in immediate vicinity of the plant is Negro. If a decision should be made later to use Negroes on productive work, much less labor would have to be imported.	Poor roads in some directions from the plant. Road to Canton, one of nearer towns of any size, is poor. More buses or trains also needed. Probably some housing for single women will be needed soon near Flora unless transportation problem solved.
Louisiana - Minden (Louisiana Ordnance) Visited March, 1942.	Plant had been in operation only a few weeks at time of visit and so had less than 300 plant and office women. However at the peak, plant expects to employ 70% women in a very large force.	There is uncertainty as to whether enough women for peak labor force can be obtained from local area from which the women employed at present have been recruited. Company officials interviewed thinks local supply of women will not be sufficient. U. S. Employment Office thinks more women may register for employment if "a drive is put on."	Family Housing Project and Government Trailer Camp under construction at Minden. After these are finished additional housing needs can more easily be determined. Women's dormitories may be needed near the plant later.

Areas and Plants Visited	Woman Labor Needs 1/	Sources of Woman Labor Supply	Comments Concerning Living Ne
Texas-Arkansas - Texarkana (Lone Star Ordnance) (Red River Depot)	Both this ordnance plant and the storage depot are about ready to begin operations. Probably ordnance plant will not reach peak production before the end of the year, but expects to employ 65% or 75% women out of a total labor force of many thousands. The storage depot also expects to employ several hundred women in addition to those who will be employed in the office.	Early recruiting for the ordnance plant has been done within a radius of 30 miles but there seemed to be general agreement that much of the labor for both of these establishments will have to be imported from beyond commuting distance.	Because of need of imported woman labor, some kind of housing for women will be needed soon. Regional official from Dallas Defense Housing Office has already been in this area to discuss plans for women's dormitories.
Arkansas - Jacksonville (Arkansas Ordnance)	Plant had been in operation only a short time but already employing several hundred women on production. At peak production this plant will probably employ one of the largest forces of women of any of the plants included in this summary, since it hopes to employ about 80% women out of a labor force of many thousands.	Workers now coming mostly from Little Rock. One plant official interviewed thought more of the labor could be obtained from within 40 miles but another one thought some workers will have to come from greater distances. Some plans being made to hire Negroes on production which will make somewhat less outside labor necessary. Uncertainty as to extent of importation to be required.	Special dormitories for women now being constructed on plant site. Three buildings will hold 73 persons each, but one dormitory may be used for men. Eating facilities will be available and plans for buildings are quite attractive. No special recreation facilities will be available though.

SHIPYARDS - PRODUCT

Total Yards emp. Fcmd rptg. No. of prod. emp: (23), 39485 20795 53

Firm Number	Name	Location	Productive Employees Total	Women Number	Women Percent
1	Charleston Navy Yard	Charleston, S. C.	18576	769	4.1
	Product: At present yard is making destroyers and has recently launched the last of a group of several LST boats (a type of military cargo vessels, used particularly in tank landing operations.) Welded type of construction predominates. Numerous sub-contractors, and other Cos. are being used. However, the yard has its own foundry for non-ferrous metal work, a forge shop, a boiler making shop, etc. Ship repair work is also done.				
2	Commercial Iron Works	Portland, Oregon	8500	240	2.8
	Product: Minesweepers, net tenders, sub-chasers, Navy tug boats, construct and outfit these boats in their entirety. Tacoma, Wash. and Commercial Iron Works puts on the flight deck, super-structure, and does general outfitting of the boats. Navy repair work - just declared an official Navy repair station for small boats.				
3	John H. Mathis Co.	Camden, N. J.			
	Product: Coast Patrol (P.C.) Boats, Net Tenders, Steel barges, repairing of boats.				
4	North Carolina Shipbuilding Co.	Wilmington, N. C.	19175		
	Product: Builds Liberty Cargo Ships - 10,500 ton tonnage. Welded and riveted, but very few rivets. W. & J. Sloane Co. makes all of the furniture and do the inside fitting of the ships. Has a shop on the shipyard grounds. Employ about 400 men. No women employed. This is "high grade work," as done in a Joiners Shop.				
5	Missouri Valley Bridge & Iron Co.	Evansville, Ind.	9100	250	2.7
	Product: Complete assembly of invader ships - "invasion barges" and transport boats. Are completely outfitted and assembled. The Mo. Valley Bridge & Iron Co. has its main plant at Leavenworth, Kansas. This company plus Bechtel, McCane, Parsons, Corp.; Sollitt Construction Co., Inc.; Winston Bros. and C. F. Haglin are joint ventures in this Evansville Ship project as prime contractors. This is an assembly plant. Sub- contractors provide parts. No large machine shops here. Hulls, etc., are fabricated and outfitted. Ship is fabricated in parts before assembly.				
6	Barbour Boat Works	New Bern, N. C.	790	0	
	Product: Build minesweepers, salvage boats and net tenders; net tenders are of same construction as salvage boats. All are of wood and "are atrociously heavy." These boats can't leave during a storm "but must stand by and take it." Boats are wooden principally, with some steel.				

Blue figures = anticipated employment - productive, written below present employment in each yard.

See attached sheet for Dept. of Labor Instruction July 6, 1943

Firm Number	Name	Location	Productive Employees Total	Women Number	Women Percent
7	Elizabeth City Shipyards	Elizabeth City, N. C.	498	0	
	Product: 110 ft. Submarine Chasers (wood) for the Navy.				
8	Brunswick Marine Construction Co. South Yard.	Brunswick, Georgia	5428 NR	239 NR	4.4 NR
	Product: Liberty Ships, Cargo Vessels. All castings and forgings bought outside. All galvanizing done outside. Various other parts received from other manufacturers. (Possibly may vary from time to time.) At present most of lighter sheet metal work being done elsewhere.		(T-9600 4/1/43)		
9	Manteo Boat Works	Manteo, N. C.	171	0	
	Product: First contract was for lend lease - 14 foot sail boats for Navy. Now make 83 foot and 100 foot Army Rescue boats (wooden).		no expansion planned		
10	Boston Navy Yard	Charlestown, Mass.	37,000 NR	2187 NR	5.9 NR
	Product: Repair is done at S. Boston. At Charlestown they build destroyers and British escort ships. The ways are too small for cruisers or battleships. Electric motors, engines, guns, etc. are subcontracted and everything that can just as well be made elsewhere. All rope for the Navy is made in Charlestown.		(Expect to triple no. of women in mach. shop. NR. date)		
11	U. S. Navy Yard	Portsmouth, N. H.	16,369 NR	924 NR	5.6 NR
	Product: Submarines and submarine repair work. Subcontract all they can, reserving to be made at the Yard parts not readily made elsewhere. Motors, guns, engines all made outside.		T 23000-24000 (increase to be largely women) Date-NR		
13	Palmer Scott Co.	New Bedford, Mass.	208	8	3.8
	Product: 1. Wooden launches for Army for use on transports, landing boats, supply boats, etc. They are 40 to 50 ft. long, carry 90-150 men. 2. Coast Guard picket boats, about 50 ft. with a little more equipment (small house, toilets.) 3. Small Navy launch, 30 ft., used to carry ammunition and supplies to Navy planes (confidential) re supply with torpedoes, etc. They buy engines (diesel), batteries, hardware but install everything and turn out finished product. Have Navy "E".		no expansion planned		
12	George Lawley & Son Corp.	Neponset, Mass.	2725 NR	20 NR	0.7 NR
	Product: For the Navy "PC", "YO" tankers, "LCI" - all about 175 feet. For the Army 65 ft. tugs. Now 100% defense and all steelboats. Engines, guns, etc. are subcontracted but installed here. All boats leave the Yard completely equipped, ready for sea.		(T-5000. NR date)		

Item Number	Name	Location	Productive Employees Total	Productive Employees Women Number	Productive Employees Women Percent
14	Cramp Shipbuilding Company Product: Submarines, Cruisers, Naval Tug boats. Some converting of ships to troop transports.	Philadelphia, Pa.	est. 12314 ~~NR~~ NR	228 n/a	1.9 n/a
15	Walsh - Kaiser Co., Inc. Product: Liberty cargo ships (420 ft.) Soon to build corvettes half as long. Subcontract a great deal including machine and electrical equipment. The steel plates are rolled outside. Outfitting is completed at the pier. There are 5 ways. The "John Clark" was at the outfitting pier.	Providence, R. I.	9795. ~~8487~~ NR	638. ~~494~~ NR	6.5. ~~5.8~~ NR
16	Norfolk Navy Yard Product: Repair ships - 50%. New combat ships of many kinds and sizes, metal and wooden furniture for all yards, diesel engines for all yards - "build sub-chasers and destroyers." Not mass production. Many types of ships. Build LST or landing ships.	Portsmouth, Va.	38182 NR	1874 +10,000 NR	4.9 NR
17	Newport News Shipbuilding & Dry Dock Co. Product: Building airplane carriers, cruisers and Co. builds own boilers - (Many Cos. sublet this) - All for the Navy. Doing about 10% repair work now, this varies from time to time. Have completed a large no. of landing vessels already. (Confidential - One specially improved landing vessel, partly designed by this yard.)	Newport News, Va.	27,310 Peak probably reached May.	516 no. of women increased 3-4 months (7/43) probably NR on 1/0	1.9
18	Alabama Drydock and Shipbuilding Corp. Product: Co. does repair work on many types of vessels. New docks and a new shop now being constructed for Naval repair work. Co. formerly made cargo boats in new ship construction yard but is now building large tankers.	Mobile, Ala.	25,457 NR T-35,000. NR date	800 NR no. women will increase NR/0	3.1 NR
19	Gulf Shipbuilding Corp. Product: Cargo ships (C2 type.) Also building minesweepers and destroyers for the Navy.	Chickasaw, Ala.	9822 T 14,000 NR date	747 2100 "Rather less"	7.6 15%
20	Bethlehem-Hingham Product: Landing craft (used in Africa) and Destroyer Escorts formerly for British now for U. S. Buy engines, electrical equipment, etc. and install them at the pier.	Hingham, Mass.	14,712 Prod-29,200 March '44	591 NR	4.0 NR
21	Bethlehem Steel Co., Shipbuilding Fore River Yard Product: Light and heavy cruisers, destroyers, escort vessels, landing barges, aircraft carriers.	Quincy, Mass.	est. ~~25306 NR~~ Prod.-NR	150 1000 Late NR	0.6 NR

(no expansion expected) Force will probably return to 32,000 (total) & stay there.

Form Number	Name	Location	Productive Employees Total	Women Number	Women Percent
22	The Maryland Dry Dock Co.	Fairfield, Md.	8248	311	3.8
	Product: 100% repair work for Maritime Comm., Navy and the Army Engineers - (repaired dredges for the Engineers.)		T 9500 6/15/43 (probably will take same proportion of M & F)	NR	NR
23	Bethlehem-Fairfield Shipyard Inc.	Fairfield, Md.	42903	701	1.6
	Product: 100% building - no repair. Build 10,000 ton cargo ships - 40% riveted, 60% welded. Known as the Liberty Ship.		NR T-46000 maybe 6/43 NR no. of women	NR	NR
24	Bethlehem Key Highway Shipyard	Baltimore, Md.	9526	102	1.1
	Product: 100% repair work. For the Navy, U. S. Maritime Comm., and the Army Transport.		NR T-13000 end of 1943 NR no. of women	NR	NR
25	Owens Yacht Co.	Dundalk, Md.	427	0	-
	Product: Build Commando wooden boats and Army crash boats (wood).		T-650 Late June 43	NR	large %
26	Electric Boat Co.	Groton, Conn.	10243	548	5.3
	Product: Submarines; ships are completely finished and fitted here. Certain parts - motors, engines, batteries, reduction gears for propellers are supplied by Navy but installed here. Officers who are to command submarines are stationed here during construction and know their ship literally inside out.		Prod-12750 Sept 43	NR	large %
			("majority of new workers may have to be women")		probably
27	Ingalls Shipbuilding Corp.	Pascagoula, Miss. Miles	8818	665	7.5
	Product: Making a variety of boats - cargo boats, troop transports, and Navy net layers. Also converting 2 boats into small aircraft carriers. Various contracts from Maritime Commission, Navy, and British Govt. Contracts not cost-plus-fee arrangements. Straight contracts. All welded ships are made. (Said to be the first Co. to develop all-welded ships.) This shipyard is owned by the Ingalls Iron Works and the Birmingham Tank Co. (also owned by Ingalls) in Birmingham. A good deal of the prefabricating work is done in Birmingham, as well as iron and steel work, and parts are brought to Pascagoula on Flat cars. Same company also has another plant (steel, presumably) in Verona, Penna. Company is also beginning a new shipyard at Decatur, Ala. to construct coastal cargo vessels—258 ft. long. (Has a contract for 6 under a fixed-contract price of $950,000 each.)		NR (T-15000 Dec 43	NR 5000	NR 1/3)
28	New England Shipbuilding Corp.	South Portland, Maine	27433	2523	9.2
	Product: Liberty cargo ships		Prod- 7/43 30,000	NR	NR
			(Expect 30% of T to be women)		

Number	Name	Location	Productive Employees Total	Women Number	Women Percent
29	Bath Iron Works	Bath, Maine	11557 (Apr 43)	995	8.6
	Product: Destroyers. Do not sub-contract themselves buy turbines, motors, reduction gears, some small machine parts.		Prod 11557 Sept. 43	1795	16%
30	Dafoe Shipbuilding Co.	Bay City, Mich.	2867	0	—
	Product: Destroyer escorts and patrol vessels for Navy.		Prod. 4000 (Office 143	900 58)	22.5%
31	Mare Island Navy Yard	San Francisco, Calif.	35076 (April 43)	4891	13.9
	Product: New construction and repair work. New construction includes the manufacture of submarines, destroyers, destroyer escorts, submarine tenders, landing barges, life rafts, life boats and 26 kinds of boats ranking in size from 12 ft. to 50 ft. Repair work is being done on practically every type Naval vessel including submarines, destroyers, battleships, destroyer escorts, etc. and this type of work is of importance.		T 45000 End of 1943	NR (special 7000-15000 no. of F)	NR
	In addition to the more customary shipyard activities the Navy Yard carries on a number of auxiliary processes which are not peculiar to shipyards. It has its own paint factory where it manufactures paint used in the Mare Island Navy Yard and in other Navy Yards and repair bases on the West Coast. There is a bucket shop in which buckets are manufactured for holding the paint. There is a rubber shop making rubber gaskets, insulating tubing, small rubber tires for yard trucks, etc. The print shop prints forms used in administrative offices of the various Navy Yards, depots, and stations on the Pacific Coast.				
	Both the construction of new ships and the repair of old ones demand specialized work in the Yard. Each ship is a custom-made job.				
32.	Savannah Machine & Foundry Co. (Shipbuilding Division)	Savannah, Ga.	2,100	70	3.3
	Product: Building escort mine sweepers. a drydock for repairing ships is to be completed about July 1.		(1) T 2500 (USES) 10/43 (2) T not over 3000 est of pers. director 7/44	NR 300	NR 10%
			V 10,997	1044	9.5
33.	Southeastern Shipbuilding Co.	Savannah Ga.			
	Product: Build liberty cargo ships. All painting is subcontract work by Oceanic Co. of N.Y. All joiner work is subcontracted; also all pipe installation and all plastic armor work.		T 15000-8/43 = 3500		23.0
			2,158	21	1.0
34.	Charleston Shipbuilding & Drydock Co.	Charleston, S.C.	T (USES) 3900 5/44 (agent thereof doubts about any expansion)	NR	NR
	Product: Build seagoing Tugs. Several parts are subcontracted. The electric shop is a subcontract of Miller Electric Co. Much made-up wood is bought (mess tables, etc.), also weather cloths. Will soon do repair work — drydock is about ready.				

Firm Number	Name	Location	Productive Employees Total	Women Number	Women Percent
35.	New York Navy Yard	Brooklyn, N.Y.	56,398*	2,824	5.0

Product: Naval repair - 6 dry docks. Building battleship Missouri. Completed the Iowa. One aircraft carrier on the ways and one being built in a drydock. Also build carriers of cruiser size.

Prod. - NR — Approx. 9000 "withings" (by 6/44) — NR

# 36	Todd Shipbldg Corp.	Hoboken, N.J.	8000	140 in yard	1.8
# 37	Todd Erie Basin Dry Dock	Brooklyn, N.Y.	13900	120	0.9

Almost entirely repair yard, but does some jobs of construction such as ore mall boats for harbor, etc.

b. Defense product, tie-up in relation to completed product, subcontracting, etc.

Largest repair yard on east coast. Only new construction on landing barges last fall. Conversion jobs and completion of huge communication and headquarters vessels (15 percent of total ship prepared here) "Scythia" under repair after bombing. Two graving docks (like Navy dry docks), five lifting docks (ships are lifted on pontoons) Huge floating dry dock. Repair every type of vessel in world.

# 38	New York Shipbldg Corp.	Camden, N.J.	28,126*	1436	5.1

Product: Building Naval Combat ships. (Battleships, cruisers battleship aircraft carriers etc.) Ships of various kinds + sizes. All ships are custom-built, and since nearly every ship is different from every other, mass production is impossible. Co. also designs + furnishes plans to other shipbldg concerns and its "Designing + Drafting force is largest in U.S." Some subcontracting — some standardized products that meet navy specifications are bought outside, like Blowers, Gen. Elec. Motors, etc.

Reached peak. Hope not to have to use many hired women

# 39	Sun Shipbldg + Drydock Co.	Chester Pa.	34,035*	1565*	4.6*

Product: Much custom work, and some ship-repair. This Co. also does some oil-refinery work and mfg. of oil refinery equipment. Co. builds, also, many of same kind of ships mostly oil tankers, after a somewhat similar pattern, and cargo ships. Co. subcontracts much of its small work like - ladders, furniture (Subsom. Co. has works in this yard and Sun Ship pays some of the salaries, etc.) Much Machine-Shop work, like Diesel engines.

Peak — Expect no. of women to double in next year. (WMC. Phila area.)

#40	Puget Sound Navy Yard	Bremerton, Wash.	25,236	3800	15.1
			35000	7000	

Product: Repair base and a new construction yard, and although at present the former work takes precedence over the latter, women are used in most shops on both types of work.

Facility number	Name	Location	Productive Employees Total	Productive Employees women no.	Productive Employees women Percent
# 41	Seattle-Tacoma Shipbldg Corp.	Tacoma Wash.	24617	1584	6.4

Product: Under Navy contracts, is making mainly aircraft carriers; also some tankers, escort vessels, and a few cargo ships. all new construction work; no repair.

Total 26,000 - NK date
(expect to decrease + stay at 26000 for duration)

No. & proportion of F will increase but NK how much.

Scope

I KEY TO NUMBER IDENTIFYING YARDS SURVEYED BY WOMEN'S BUREAU

Number		Name and location of Yard	Total Employment	Total Women
1	SA	Charleston Navy Yard, Charleston, S. C.	21,362	2,384
2	P	Commercial Iron Works, Portland, Oregon	9,000	540
3	NA	O Mathis, John H. Co., Camden, New Jersey	1,745	32
4	S.A.	North Carolina Shipbldg., Wilmington, N. C.	20,805	805
5	M.V.	Missouri Valley Bridge & Iron, Evansville, Ind.	12,150	1,200
6	S.A.	O Barbour Boat Works, New Bern, N. C.	816	11
7	S.A.	O Elizabeth City Shipyds., Elizabeth City, N. C.	595	37
8	S.A.	Brunswick Marine Cons't. Co., South Yd., Brunswick, Ga.	5,948	540
9	S.A.	O Manteo Boat Works, Manteo, North Carolina	185	3
10	NA	Boston Navy Yard, U.S., Charleston, Massachusetts	44,000	4,394
11	NA	U. S. Navy Yard, Portsmouth, New Hampshire	18,771	1,811
12	NA	Lawley, George & Son, Corp., Neponset, Mass.	2,829	70
13	NA	Palmer Scott Co., New Bedford, Massachusetts	220	17
14	NA	Cramp Shipbuilding Co., Philadelphia, Pa.	14,129	627
15	NA	Walsh-Kaiser Co. Shipbuilding, Providence, R. I.	14,978	1,228
16	SA	Norfolk Navy Yard, Portsmouth, Virginia	42,639	4,277
17	S.A.	Newport News Shipbuilding & Drydock, Newport News, Va.	31,153	1,409
18	G	Alabama Drydock & Shipbuilding, Mobile, Alabama	27,133	1,184
19	G.	Gulf Shipbuilding Chicasaw, Alabama	10,622	1,047
20	NA	Bethlehem-Hingham, Hingham, Massachusetts	16,347	1,338
21	NA	Bethlehem Steel Co., Fore River Yd., Quincy, Mass.	29,937	1,117
22	NA	Maryland Dry Dock Co., Fairfield, Maryland	8,532	410
23	NA	Bethlehem Fairfield Shipyard, Baltimore, Maryland	44,653	1,422
24	NA	Bethlehem Key Highway Shipyard, Baltimore, Maryland	10,063	239
25	NA	O Owens Yacht Company, Dundalk, Maryland	487	20
26	NA	Electric Boat Co., Groton, Connecticut	10,796	824
27	G	Ingalls Shipbuilding, Pascagoula, Mississippi	9,300	E. 1,350
28	NA	N. E. Shipbuilding Corp., South Portland, Maine	28,841	3,089
29	NA	Bath Iron Works, Bath, Maine	11,92~~11,691~~	1,174
30	G.L.	O Dafoe Shipbuilding Co., Bay City, Michigan	3,000	48
31	P	Mare Island Navy Yard, Mare Island, California	39,909	7,821
32	SA	Savannah Machine & Foundry Co., Savannah, Ga.	2,300	170
33	S.A.	Southeastern Shipbuilding Co., Savannah, Ga.	13,189	E. 1,300
34	S.A.	Charleston Shipbuilding & Drydock, Charleston, S. C.	2,553	157
35	NA	New York Navy Yard, Brooklyn, New York	64,137	6,213
36	NA	Todd Shipbuilding Corp., Hoboken, New Jersey	8,500	E. 300
37	NA	Todd Erie Basin Drydocks, Inc., Brooklyn, New York	14,300	400
38	NA	New York Shipbuilding Corp., Camden, New Jersey	29,336	1,836
39	NA	Sun Shipbuilding & Drydock Co., Chester, Pennsylvania	35,353	2,112
40	P	Puget Sound Navy Yard, Bremerton, Washington	27,706	4,959
41	P.	Seattle-Tacoma Shipbuilding Corp., Tacoma, Washington	27,729	3,384
		Total in	717,969	60,899

NA = North Atlantic
P = Pacific
G = Gulf
G L = Great Lakes
Sa = South Atlantic
MV = Midland

V = Western Canada yard 10
7
O = no women in production 6

Ky - Repeals act of 1943 suspending during the war observance of certain holidays.

Okla - Operation of the Sunday law as it applies to manufacture of war materials for the United States was suspended for the duration.

U. S. DEPARTMENT OF LABOR

WOMEN'S BUREAU

To—		From—	Re Attached Please—
	Anderson.		Approve
	Nienburg.		Comment
	Larrabee.		Note
	Benham.		Note and return
	Dern.		Reply
	Erickson.		Draft of reply
	Hyde.		Signature
	Manning.		Would like to discuss
	Mettert.		File
	Pidgeon.		Date
	Robinson.		Note:
	Smith, F.		
	Spring.		
	Stitt.		
	Files.		

For Checking
as to
Miss Benham
for Checking
Material

OPO 16—24469

[illegible] suggested way - couple of minor changes.

Can we have copies to send out [illegible] suggestions. The Editor should like to have them mimeographed; Miss Shaefer should like them mimeographed it; Miss Shaefer & Lubin for copies.

STANDARD FORM NO. 64

Office Memorandum • UNITED STATES GOVERNMENT

TO : Miss Miller

DATE: August 24, 1944
3 PM

FROM : M.E. Pidgeon M.E.P.

SUBJECT: I.A.G.L.O. Report on Women in Industry

Attached for your consideration is the I.A.G.L.O. Report on Women in Industry, in response to Mr. Lubin's request (attached)

After any change you desire has been made, this might go to the Editorial Division for checking (notes for checking are attached in the left column).

If the Report seems somewhat long I have indicated two or three brief paragraphs that might possibly be omitted.

9/6/44 Telfaxed & sent 9/13/44

WOMEN IN INDUSTRY
Sept. 1943 - Sept. 1944

Annual Report to the

INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

Changes in Women's Employment
Lay-offs Occurring in Certain Industries
Movements in Women's Wages
New Labor Laws Affecting Women Workers
The I.L.O. Conference and A Far-Seeing Program for Women
Focussing Toward the Reconversion Period

Supplement: Further Details as to Labor Laws Mentioned

Orig + 3

WOMEN IN INDUSTRY

Sept. 1943 to Sept. 1944

Changes in Women's Employment

Census Labor Force Rept.

In the ~~year~~ 12 months since the ~~last~~ Report of the Women in Industry Committee in September 1943, the employment of women has continued to increase. In every month through ~~the~~ mid-summer 1/ more women were employed than in the same month in any past year.

(24 or 25 Census 1940 or our more recent study

With the seasonal advances of summer that usually follow the closing of the schools, woman employment reached an all-time high of over 18½ million in July 1944. 2/ Women, who constituted some 24 or 25 percent of all workers before Pearl Harbor, now are over 34 percent of all workers.

192-5 p.4

With the military forces inducting more and more men through the year, many additional women have taken jobs for which women formerly would not have been considered. For example, women constituted 8 percent of the plant workers in major steel mills visited by the Women's Bureau in 1943, and a little later (Jan. 1944) 10 percent of the production wage earners in shipyards. Women also have taken many technical and professional jobs, as analytical chemists, physicists,

192-6 p.1

engineers, draftsmen, technicians in laboratories, or on radio or x-ray work. Shortages of teachers, doctors, and others also have called for women in places for which they probably would not have been considered in peacetime.

The phenomenal increases that have occurred in women's employment have developed quite unevenly in the various industries and occupations, as well as in geographic locations, concentrating particularly in war-industry centers.

Spec.Bul. 20, p.13

During the war period, women who have come into the labor force from home housework, schools, or elsewhere have been drawn in largest numbers, as would be expected, into the major war manufacturing and ~~the~~ essential military and civilian supply industries. Smaller proportions have entered trade, domestic and personal service, and the business-professional group.

Ibid. p.8

Women who already were ~~in~~ employment in the pre-war days also have made striking moves into different occupation groups. Women formerly in domestic service have gone to other services and to manufacturing; those in other services have gone to the manufacturing and sales groups; those from manufacturing and sales to clerical jobs; those from clerical to manufacturing, managerial and professional types of work. Shifts in both directions have been considerable as between sales and manufacturing, sales and clerical, and domestic service and farm work.

1/ The latest figures available at time of the present report, those for July.
2/ Total women in civilian labor force, 19,110,000.

Labor Inf. Bul. Oct. 1943

Filling urgent labor requirements by the employment on a part-time basis of women who otherwise could not serve is a method not undertaken so fully in manufacturing plants in this country as in Great Britain, where labor shortages are more acute. But Women's Bureau agents have found many women on these so-called "victory shifts" in industry, which usually follow one of three patterns: short-hour or part-day shifts, often of a 4-hour stretch; week-end shifts; or shifts of approximately full daily length but for only a part of the week.

Lay-Offs Occurring in Certain Industries

Even before the Report of this Committee last year, a menacing development in women's employment was appearing. For parallel to the increases that were occurring, lay-offs were beginning to take place. These continued in early 1944, and during the later spring and summer months at the same time that seasonal employment was increasing.

WPB 1st quar. '44 rpt 189-2 p.1 WPB cit. EDB 3/4/44

A striking example of the effect of war variations in production requirements on workers, and especially on women workers, is the ~~60 percent~~ cut-back in employment that was made in the small-arms ammunition plants from the peak of July 1943 to April 1944. This is an industry employing many women and admirably fitted for their work, by reason of its small product, and processes standardized in operation, and requiring attention to detail. In these cut-backs, women were affected more drastically than men. Their employment dropped from 47 percent of the wage earners in the industry at peak production to ~~only~~ 43 percent in the first quarter of 1944. An OWI report stated that 18 in 100 women as compared to 12 in 100 men were affected by the cut-backs in this industry.

In the aircraft industry, sometimes hopefully cited as a source of future employment, cuts in women's jobs of about 6 percent occurred from the peak of November 1943 to April 1944. Further cuts announced by the Army to occur before the end of this year would reduce woman employment in this industry by at least 13 percent.

~~Moreover in industries curtailed, disturbing~~ examples ~~have been occurring~~ of dismissal according to arbitrary methods rather than by logical, orderly, well thought out plans--for example, an arbitrary rule of dismissing first all married women, or even all women, without regard to whether or not individuals had been a long-stable part of the labor force, or whether such action would cause undue suffering to dependents not otherwise provided for.

~~Just here it may be~~ well to remember that the proportion of married women in the population has increased considerably since Pearl Harbor, and that there will be many cases in which they may have to give some financial aid to disabled husbands. Consequently, it must be expected that a somewhat larger proportion of married women than formerly may have to remain in the labor force.

W & B small arms ammo

		- RE empld.	% WO
July '43	177,727		46.6
Apr '44	66,481		43.2
decr.	62,670		

AS aircraft

	Total	Factry wo	
Nov 43	479,550	361,124	
Apr '44	451,120	327,283	
decr	5,970	9,470	

Fortunately, the overall job picture at present still is an optimistic one for the worker. Shortages of labor still exist in many areas, and in the country as a whole plenty of jobs still are calling for workers. But the lay-off situation referred to gives an appalling foretaste of what might occur on a much wider scale in many industries. Imperatively it points to the necessity of plans for orderly conversion, and for methods of assuring a high level of employment.

Movements in Women's Wages

cf
NY
Ill
NICB

During the year past, women's wages have continued to rise. However, a considerable (and undeterminable) part of this is due to longer hours of work with overtime pay, a situation that cannot be expected to be of long duration.

NY Ind. Bul. Jan. 1944 p 28

As replacement of men by women continues, the question of equal pay becomes increasingly important. Women have directly replaced men who are leaving for the armed forces or for other employment. They have been promoted to vacancies created by upgrading male workers to jobs requiring fuller utilization of skills. They have been hired, as additional workers not directly replacing men, in expanding industries and occupations which hitherto employed chiefly male workers. Reports from more than 1,100 New York plants in the last part of 1943 showed two-thirds of the plants that replaced men with women paid women the same entering rates as men had received on the job.

Don't could omit 1182

Many war plants throughout the country have applied the principle of equal pay in beginning rates. But even when entrance rates for women are the ~~same~~ same as for men, difficulties often arise as to the proper upgrading and promotion of women. Women's Bureau surveys indicate that in some of the newer or better organized plants, as for example in aircraft or electrical industries, systems of upgrading are fairly well worked out, and women find some opportunities. But in many instances there is relatively little opportunity for women to advance to any considerable extent, due sometimes to a general lack of any well-organized system of upgrading, sometimes to the placement of women in jobs that are not in the usual line for the job progression, in which neither proficiency nor length of service can bring them beyond a limited early stage of the work. Flagrant cases even have been reported where women who were training ~~in~~ new workers were paid less than the male employees they were training, or were later placed under young male group leaders whom they had trained.

Sp. Bul. ~~19~~ 18 pp 7-8-9

WB Eq. pay leaflet

Unions, in the main, have been active in pressing for equal pay and the large unions in the "woman-employing" industries now have hundreds of contracts with equal-pay clauses. It has become evident that some type of legislation may be needed to help in advancing equal pay for women workers. New York has this year been added to the four other States 3/ having an equal-pay law. Effective July 1, ~~it~~ the law provides that no employee shall be subjected to discrimination in rate of pay because of sex. The Illinois equal-pay law, passed last year, also ~~came~~ went into effect July 1 of this year. Operations under the equal-pay laws in these two States will be watched with great interest in the year ahead.

3/ Illinois, Michigan, Montana, Washington ~~are the others.~~

During the past year, New York has passed two other laws applying to wages, Kentucky one. Perhaps most important of these is the New York amendment to the minimum-wage law providing that no male shall be paid below the minimum rate fixed for women, ~~and effective last~~ July 1. This is real pioneering in State legislation, Connecticut formerly having been the only State with effective legislation to apply to men minimum-wage provisions earlier enacted for women.

A New York law, ~~effective~~ June 1 provides ~~for~~ wages received in the Department of Labor for an employee, ~~but~~ unclaimed in a year's time, ~~to~~ be deemed abandoned property; and a new Kentucky law provides that employers of ~~ten~~ or more persons shall furnish their workers ~~at~~ each pay ~~period~~ with statements of the purposes of any wage deductions /as for social security, for example/.

From these fragmentary evidences of progress and of continued need for advancement, it is apparent that much ~~further~~ work ~~needs~~ to be done to secure for women both equal pay on the job and equal opportunities for training and for advancement.

New Labor Laws Affecting Women Workers

As you know, the past year has been one of ~~few~~ legislative sessions, and hence there have been few changes in State labor laws affecting women. Wage legislation, passed in two States, New York and Kentucky, is referred to elsewhere. War-powers acts, which permit relaxations in State laws for the safeguarding of women workers, were re-enacted or extended in two States—Connecticut and Louisiana. A Virginia act extends the hour maximum for women engaged in essential war work. /See Supplement for further details./

In this year of few legislative sessions, and in this particular period when rapid industrial changes are occurring and are about to occur, it may be a good time to stress the fact that the mere passage of a labor law, even of a good law, has in itself only a limited value in securing the ~~best~~ conditions desired for workers. Adequate inspection personnel and practices are an indispensable corollary to even ~~a good~~ laws.

Strong basic legal backing has been found necessary to enable effective dealing with the exceptional recalcitrant employer, but much of ~~the operation of~~ employer's ~~in their~~ relations with workers is in the realm not of law but of social custom, and has its foundation in a competent knowledge of wise methods of handling personnel and of the factors necessary to workers' health and welfare and to good standards of production. Even when satisfactory legislation is ~~was~~ lacking, ~~I have often seen~~ informed and tactful inspectors do much to stimulate employers toward the best practices in employment and operation.

The I.L.O. Conference and A Far-Seeing Program for Women

An important labor mile-stone was last spring's Philadelphia meeting of delegates from 43 countries in the ~~regular~~ conference of the International Labor Organization held after a 4-year war suspension of its annual legislative assemblies.

A ~~great~~ forward-looking program for working women is one of the results of this Conference, underlined by specific points that apply to women in its adopted programs, and ~~also~~ fully including them in the over-all "Declaration" of the Conference, popularly called the "Philadelphia Charter."

Charter Com. IV — Very important to working women are its provisions, as for example those for "full employment and the raising of ~~the~~ standards of living," "adequate protection for the life and health of workers in all occupations," and many others, as well as the comprehensive social security program approved by the Conference.

Com. III Survey Graphic/July '44 Labor Inf. Bul. 7/44 p4 — The program for the guidance of governments adopted by the Conference includes plans for a public employment service, for demobilization, reemployment, training, and adjustment of women in the industrial shift-over; ~~and~~ recommends that: "The redistribution of women workers in each national economy should be carried out on the principle of complete equality of opportunity for men and women in respect of admission to employment on the basis of their individual merit, skill, and experience, and steps should be taken to encourage the establishment of wage rates on the basis of job content, without regard to sex."

Com. I & II — The Conference resolution intended for inclusion in a general or special treaty between nations seeks to assure international collaboration on major matters to improve the lot of ordinary men and women, as in opportunities for employment, education and training, medical care, income security, and for the right of free association.

Com. V — A report approved by the Conference proposing minimum standards of social policy for dependent territories includes the provision for improvement in the employment and social status of women in such territories.

Focussing Toward the Reconversion Period

The serious consequences to some workers of the recent lay-offs (referred to) sharply force ~~us to~~ a begin ~~to~~ thinking constructively about the reconversion problems and to devise now effective ways to meet them. Primarily, of course, ~~our~~ thinking must be directed toward methods of developing a high level of employment, including ~~the~~ employment ~~of~~ women workers. Some of the women who have entered the labor force will not remain there. But many women must continue at work.

The skills of women that have been so valuable to industry during the war period must not be lost now. Ways must be found to use them. The services that women have given while this country has an extreme need for their work make it an obligation on the public authorities to see to it:

(1) That women are not dismissed for arbitrary reasons, but that when cut-downs are necessary, women shall be retained on the job in reasonable proportions, and that when imperative circumstances do require some to go they shall be given suitable advance notice;

(2) That the public placement agencies give women as effective service as conditions make possible in finding jobs;

(3) That ~~in the time~~ women ~~are~~ jobless, ~~unfair~~ technical interpretations ~~shall not be allowed to bar them from receipt of the unemployment compensation they have built up~~ are, in effect, discriminatory against them.

(4) That ~~methods~~ be planned ~~as effectively as~~ possible ~~for~~ developing job opportunities for those women who find it necessary to remain in the labor force.

~~In this,~~ labor officials will ~~deem it of~~ paramount importance ~~to~~ placing their full influence and effort behind effective policies designed to promote a high level of employment.

Discuss at conf. with no. of States that had legisl. recs.

WOMEN IN INDUSTRY, SEPT. 1943 & SEPT. 1944
Report to International Association of Governmental Labor Officials

Supplement: Further Details as to Labor Laws Mentioned

War ~~Powers~~ Relaxation Acts

- relaxation enacted,

War ~~powers~~ acts were re-enacted or extended in ~~two~~ four States--Connecticut, Kentucky, Louisiana, and Oklahoma.

Ky repeals war suspension of holidays provides Okla was last of Saturday laws. Ky

Connecticut - The ~~Act~~ empowering the Governor to modify or suspend any statute conflicting with the war effort is extended to February 1, 1945.

Insert from attached

Louisiana - The ~~Act~~ empowering the Commissioner of Labor to grant or to revoke dispensations from labor laws was re-enacted. (in part amended and) It provides for such dispensations to be issued only when warranted by emergency, and only for a 6-month period; the workers' health and welfare must be safe guarded; and no dispensations are to be made for minors, and for women time and a half must be paid for every hour worked beyond the peacetime maximum, (normally 54 hours a week, except for certain seasonal industries).

Okla → Insert

Hour-Law Amendment

as amended, no dispensation shall be granted "unless warranted by the war emergency" (was "to any employer outside of war work") nor for employment of minors under 16 years (was 18).

(Fact sheet)

Virginia - An amendment to the hour law, effective March 3~~d~~, 1944, and limited to a two-year period (unless the war ends sooner) extends the 9-48-hour limit for women's work to 10-52 in essential war work, providing that the Commissioner of Labor still can issue as before permits for longer hours (up to 56 a week).

Wage Laws

Three acts or amendments relating to women's wages were passed in New York, one in Kentucky.

Where else could slip go?

Kentucky - All employers of 10 or more persons must furnish the worker on each pay day with a statement of deductions made from that period's pay (~~as~~ as for social security, ~~etc.~~ for example).

New York -

(1) Minimum Wage - An amendment to the law provides that no male shall be employed in any occupation at less than the minimum standards or rates of wages fixed for women and minors in such occupation.

(2) Equal Pay - A new ~~Act~~ provides that no employee shall, because of sex, be subjected to any discrimination in the rate of her or his pay. A differential in pay between employees based on a factor or factors other than sex shall not constitute discrimination.

(3) Unclaimed Wages - A new ~~Act~~ provides that wages received from an employer by the Department of Labor and remaining unclaimed for one year after receipt by the department shall be deemed abandoned property.

WOMEN IN INDUSTRY

A report to the Annual Meeting of the

INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

~~October 1943~~
October 5-10, 1943
Chicago, Ill.

CONTENTS

Women's New Employment
Recruitment of Women
Keeping Up Work Standards
Equal Pay
The Future

With the rapid movement of recent events, it seems incredible that at our last meeting two years ago, we still spoke in terms of "defense." One of the most striking occurrences during this time has been the ready response of women to their country's call to work--in factory, mill, transportation system, restaurant, store, laundry, office, mine, lumber camp, and on the farm.

WOMEN'S NEW EMPLOYMENT

Latest available labor force figures show over 17 million women employed. This adds at least a third to the greatest number of women ever before in the labor force in the history of this country. With shortage of manpower becoming acute in an increasing number of areas, the Chairman of the War Manpower Commission decreed a year ago that "Every effort is to be made to recruit and refer women, including older women, for employment or training on the basis of their qualifications." Since the Spring of 1942, women have constituted more than four-fifths of the increases in factory workers. By June of 1943, in the production of the basic war materials alone, nearly 2 million women were at work.

From new P.3. B.L.S. material

The matter of informing employers as to the work women could do and the conditions effective for their employment has become continually more pressing. In order to determine where and how women could work best, the Women's Bureau made intensive surveys of the jobs suited for their performance in various war industries--in the making of aircraft, guns, ammunition, instruments, ships, machine tools. The need for such surveys and their value has been increasingly evident as employers newly faced with the problem of adding more and more women to their forces repeatedly have called for advice of all types.

In the Spring of 1941, for example, scarcely 150 women factory workers were employed in seven major aircraft assembly plants visited by Women's Bureau agents. Employers were not greatly interested. Six months later, when even before Pearl Harbor it had become evident that the male labor force would be depleted, and when ~~they~~ plants were being pressed to employ women, these same aircraft employers were eager to seek the advice of our agents, not only as to the kinds of jobs women could do, and hazards on certain work, but as to policies on a long series of knotty problems, the solution of which was well known to us but unfamiliar to those who formerly had not supervised many women--for example, as to pay rates on various jobs, effective training plans, provision of dressing rooms, approved standards for protective work clothing, night work and suitable arrangement of work shifts, policies regarding employment of married women, personnel policies best suited to adapting women to the factory routine, and so forth. ~~Today~~ In June 1943 more than ~~300,000~~ (322,000) women help to make airframes, gliders, engines, and propellers.

~~Following~~ Beginning later, the commercial shipyards, having only 2,400 women wage earners in June 1942, within a year were employing more than 88,000.

Other industry groups employing women also have shifted, in adjustment to war needs, showing enormous increases in the numbers and proportions of women in machine industries, and in all types of war manufacturing. For example, in the Spring of 1941 iron and steel industries employed 93,000 women; in June 1943 they employed over 317,000. In the same period of approximately two years, woman employment had increased in electrical machinery plants from 131,000 to more than 323,000 women; in machinery other than electrical from 43,000 to 240,000 women, in chemicals from 59,000 to 231,000 women, in rubber from 42,000 to 71,000 women.

Women advanced from 8.5 percent of the wage-earners producing durable goods in the Spring of 1941 to 22 percent in June 1943, from 3 to 27 percent of those making firearms, from 1 to 13 percent of those in machine-tool plants, from 47 to 57 percent of the wage-earners making boots and shoes, from 14 to ~~49~~ 42 percent of those making professional and scientific instruments.

In the Detroit area - a - 3 - large group of war plants employed 35,800 women a year ago, and 120,000 women last Spring.

In Illinois, over the 3-year period since 1940, there was an increase of 81 percent in numbers of women employed in manufacturing establishments, as reported, ~~as a whole,~~ 17½ percent in metals and machinery; men's employment also had increased considerably.

In California, during the past year's time the proportion of women rose from 6 to 23 percent of the ~~labor force~~ wage-earners in plants making durable goods, from 4 to 18 percent in iron and steel plants, from 27 to 45 percent in rubber plants.

In New York, machinery and electrical plants having last year a ~~labor~~ wage-earner force with 14 percent women have this year 28 percent women.

(Cal) Recruitment of Women

Naturally, ~~the recruitment of more than~~ with the addition of some 5 million women to the labor force since 1940, ~~this~~ recruitment has engaged much of the attention of the War Manpower Commission, where the duty to supply workers centers. This agency created ~~an~~ a Women's Advisory Committee, ~~on Women,~~ which recommended that employers analyze occupations and promote use of women, and that management and labor remove all barriers to their employment.

The whole-hearted response of women to the demand for their work, and the fact that already many have been laid off, both point to the wise decision that, at least up to the present, no compulsory registration of women has been either necessary or desirable. In taking this position, the War Manpower Commission has defined the areas of acute labor shortages. In such areas, if efforts toward individual recruitment of women have been tried and found insufficient, voluntary enrollments of women are permitted, provided that ~~(a)~~ employers have agreed that they can at once employ many women; ~~(b)~~ it is shown that workers are being effectively used and that the shortage therefore is a real one; ~~(c)~~ there is evidence of a local supply of woman labor with control of outside migration; and ~~(d)~~ the work standards that I shall later ~~referred~~ to ~~above~~ are observed.

A large number of communities with bona fide labor shortages have taken advantage of these voluntary enrollments. Recent months have seen lay-offs in a number of communities, and the need for an enrollment of women on a national scale is not evident at present. Nor will it be, so long as we still have some unemployed women, nor until we have the assurance, now often lacking, that women workers are being effectively used on the job.

KEEPING UP WORK STANDARDS

Many of the Labor Commissioners present recall only too vividly that first sudden impact of the v[redacted] demand for a breakdown of State laws affecting women, and the beginnings of their own valiant labors to uphold, so far as they were able, the work standards known as best to assure human welfare and efficiency on the job. These efforts of State Commissioners were vigorously supported by Federal agencies, seven of which immediately joined in recommendations re-stating the outlines of such standards, which are so important that they again should be summarized here for our record:

> A maximum work period of not more than 8 hours a day and 48 hours a week, with one day's rest in seven; adequate meal and rest periods; proper safeguards for health and safety; and the same wage rates for women as for men.

Agencies recommending these principles were the War, Navy, and Labor Departments, Maritime Commission, War Manpower Commission, War Production Board, and Office of Defense Transportation; the Public Health Service and the Commerce Department also concurred in the recommendations on hours of work.

In general terms it may be stated that in most of the States legislation regulating hours and providing adequate conditions of work for women enables exceptions to be made for emergency conditions; in some other States, such exceptions have been allowed by responsible authorities. Since the outbreak of war a considerable number of States have passed emergency acts specifically authorizing the Governor or director of labor to permit relaxation of labor laws.

In many of these cases, strong efforts have been made to assure that the exceptions will be temporary, by providing rigid permit requirements and prior investigations of each case, issuing permits for limited periods, and applying the exemptions to bona fide war workers only, or to extreme emergencies due to

shortage of personnel, or to special need for particular skills requiring considerable training periods, and the like. In many cases, too, discussions with employers have convinced them that their demands were inconsistent with their own longer-time requirements for efficient production, and their requests were withdrawn. Nevertheless, a recent New York report showed that such dispensations, over an 18-month period, applied to over 229,000 women in nearly 2,200 war plants, usually permitting night work or hours beyond 48 a week. Similarly, in California laws have been relaxed for 1,100 firms, roughly two-thirds of them during 1943.

Even more serious are the relaxations effected during 1943 by legislation setting aside or raising the maximum on hours of work in some 16 States, most of them major industrial States, and practically all having important war plants. In 7 of these States the 1943 war-time acts (in one case a proclamation) provide no maximum limit to daily or weekly hours.

Some of these legal changes nullify gains hard-won through long years. In short, rigid adherence to the best work standards has been relaxed in many instances, and there must be a speedy return to them immediately after the war. The post-war economy will require a rapid shortening of hours, which will restore the more normal leisure time necessary for workers' health and well-being. For many months past, there has been considerable evidence that the burden of over-long hours is taking a heavy toll of the energy and health of women workers. Frequent reports by agents of the Women's Bureau from various sections of the country indicate that in many war plants women workers are becoming fatigued much beyond the efficiency point; some are so exhausted they are quitting the job entirely.

Over-long hours also cause an increased absence rate. A recent New York report showed the rate of absence definitely higher with a 6-day rather than a 5- or 5½-day week, and higher also when lunch period and rest periods were inadequate. Similar situations are found wherever absence causes are investigated.

It is especially important in war time, when peak production is required, that conditions of work forestall excessive fatigue, and provide the workers with sufficient time for the necessary business connected with living. Women workers particularly require this, because they usually have very definite

household responsibilities in addition to those of their paid employment--responsibilities that war-time conditions make unusually difficult and time consuming.

EQUAL PAY

A major problem in a labor force being rapidly expanded with women workers is the maintenance of wage standards. Important at all times, equal pay on the job without regard to the worker's sex becomes all the more pressing in such a period as this. It little furthers our cause if men return from the armed forces to find the standards of their wage broken down, or if women find themselves unable to obtain a living wage even though they are exerting their fullest effort to serve their country on the production line.

This is no new problem. Unions have recognised the equal-pay principle as a safeguard to wage standards, and many of their agreements now include clauses providing for it. Government policy for equal pay has been expressed repeatedly by various agencies over a long period of years. The earlier War Labor Board of World War I announced it, and applied it in more than 50 cases ~~decisions~~. The present War Labor Board went much further in the General Motors case, defining equal pay to exclude the reduction of women's pay standards by slight alterations that make job organization more efficient.

The level of women's wages this year is above that of last year, but they still are less than 60 per cent of men's; they are not so near to men's wages as they were after the old N.R.A. had raised the wage levels of women.

Owing to many technicalities, and to peculiar circumstances in many cases, the ideal thus is not yet attained, but real progress has been made, both in definition of the problem and in attitude toward it. The Board's directives seeking to hold wages against an inflationary spiral, still make allowance for adjustments where women's wages are below the rate for the job.

The progress in public understanding of the importance of equal pay is attested to by the fact that Illinois and Washington added their names to that of Michigan as States with laws providing for equal pay. A notable decision of the Michigan Supreme Court upheld the law in that State, and afforded the required back pay to women.

~~to a large number of women workers in General Motors employ.~~

The Association's Minimum-Wage Committee will discuss pay questions in more detail.

THE FUTURE

Of course our great primary purpose in America at the present time is to win the war. And in that, I say to you that every bit as important as the flying of a Fortress, the taking of an enemy entrenchment, or the sinking of a battleship is the work of those women as well as men who measure the accurate instruments or carefully grind or inspect the small metal parts for that Fortress, who heat-treat the metal or test the guns of those soldiers, or pack the cartridges for their belts. To win the objectives of this war we must bring the Four Freedoms to these workers. We must enable the needy woman worker as well as the man worker and the soldier, <u>first</u> to tide over the period of transition, and <u>second</u> to obtain work in the rebuilt peace economy.

Many of the 5 million women who are now employed in addition to those formerly in the labor market will be glad to return to their homes after the war. Others can not do so, but must remain permanently in the labor market. They have helped enormously in the vast war-production program, carrying along month after month the tedious factory routine and essential civilian services. Even before this time, large proportions of employed women supported dependents. The war casualties already have increased these burdens on women workers. Their needs,

like these of other workers, must be met in the post-war transition period.

~~Wage cuts and dismissals must not be permitted to affect women more drastically than other workers.~~

Technicalities in unemployment compensation, in no ~~wise~~ wise related to the performance or needs of the worker, must not be ~~allowed~~ permitted to cut women off from just benefits.

Seniority provisions must not be allowed to militate unduly against women.

These are but a few of the policies that must be prepared for by present action. Workers--women as well as men--must be tided over the transition period and helped to find future jobs. Only thus can we establish the victory within our own economic system.

Where cut downs in force of workers become necessary, equitable plans must be worked out so that the effects do not fall more heavily on women ~~are not affected~~

Checked Copy

WOMEN IN INDUSTRY

A report to the Annual Meeting of the

INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

~~October 1943~~
October 8-10, 1943
Chicago, Ill.

Section on Canada was not checked in Ed Div.
Changes made later (Labor legis. especially not checked by EB)

CONTENTS

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See retyping, attached

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July 17.1 (Aug mtbl due by Sept.) Census Labor Force. (18 mill expected) seems s.p. when ready to check Aug 17.4

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Greatest Nov 12.75 17.1 4.3 mill or 33.7 pc of 12.75 mill

With shortage of manpower becoming acute in an increasing number of areas, the Chairman of the War Manpower Commission decreed a year ago that "Every effort is to be made to recruit and refer women, including older women, for jobs and training on the basis of their qualifications." The question of informing employers as to the work women could do and the conditions effective for their employment has become continually more pressing. In order to determine where and how women could work best, the Women's Bureau made intensive surveys of the jobs suited for their performance in various war industries--in the making of aircraft, guns, ammunition, instruments, ships, machine tools.

Oct 19 1942 X4932

employment

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In the Spring of 1941, for example, scarcely 150 women factory workers were employed in seven major aircraft assembly plants visited by Women's Bureau agents. Employers were not greatly interested. Six months later, when even before Pearl Harbor it had become evident that the male labor force would be depleted, and when they were being pressed to employ women, these same aircraft employers were eager to seek the advice of our agents, not only as to the kinds of jobs women could do, and hazards on certain work, but as to policies on a long series of knotty problems, the solution of which was well known to us but unfamiliar to those who formerly had not supervised many women--for example, as to pay rates on various jobs, effective training plans, provision of dressing rooms, approved standards for protective work clothing, night work, and suitable arrangement of work shifts, policies regarding employment of married women, personnel policies best suited to adapting women to the factory routine, and so forth. Today more than 300,000 women help make airplanes, airframes, gliders, engines, and propellers.

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Other industry groups employing women also have shifted, in adjustment to war needs. ~~Available data~~ show enormous increases in proportions of women in machine industries, and in all types of war manufacturing.

~~RECRUITMENT OF WOMEN~~

Over a 6-month period the proportion of women increased from 35 percent of the total labor force in major electrical machinery plants to 44 percent; in machinery (excluding electrical) from 8 to 15 percent.

Gun plants with 10 percent women ~~in their labor force~~ last year have this year 18 percent; small arms and ammunition formerly 37 now 46 percent; rubber plants formerly 27 now 39 percent; food and kindred products formerly 21 now 34 percent; and so forth.

Following later, the commercial shipyards having only 2,400 women wage earners in June 1942 within a year were employing more than 88,000.

Other industry groups employing women also have shifted, in adjustment to war needs, showing enormous increases in the numbers and proportions of women in machine industries, and in all types of war manufacturing. For example, in the Spring of 1941 iron and steel industries employed 93,000 women, in June 1943 they employed over 317,000. In the same period of approximately two years, woman employment had increased in electrical machinery plants from 131,000 to more than 323,000 women; in machinery except electrical from 43,000 to 240,000 women, in chemicals from 59,000 to 231,000 women, in rubber from 42,000 to 71,000 women.

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June '42 — 185 — March 1

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Recruitment of women

Naturally, the recruitment of more than 5 million women to the labor force has engaged much of the attention of the War Manpower Commission, where the duty to supply workers centers. This agency created an Advisory Committee on Women, which recommended that employers analyze occupations and promote use of women, and that management and labor remove all barriers to their employment.

The whole-hearted response of women to the demand for their work, and the fact that already many have been laid off, both point to the wise decision that, at least up to the present, no compulsory registration of women has been either necessary or desirable. In taking this position, the War Manpower Commission has defined the areas of acute labor shortages. In such areas, if efforts toward individual recruitment of women have been tried and found insufficient, voluntary enrollments of women are permitted, if employers have agreed that they can at once employ many women; if it is shown that workers are being effectively used and that the shortage therefore is a real one; if there is evidence of a local supply of woman labor with control of outside migration; and if the work standards referred to above are observed.

A large number of communities with bonafide labor shortages have taken advantage of these voluntary enrollments. Recent months have seen lay-offs in a number of communities, and the need for an enrollment of women on a national scale is not evident at present. Nor will it be, so long as we still have some unemployed women, nor until we have the assurance, now often lacking, that women workers are being effectively used on the job.

KEEPING UP WORK STANDARDS

Many of the Labor Commissioners present recall only too vividly that first sudden impact of the vigorous demand for a breakdown of State laws affecting women, and the beginnings of their own valiant labors to uphold, so far as they were able, the work standards known as best to assure human welfare and efficiency on the job. These efforts of State Commissioners were vigorously supported by Federal agencies, seven of which immediately joined in recommendations re-stating the outlines of such standards, which are so important that they again should be summarized here for our record:

> A maximum work period of not more than 8 hours a day and 48 hours a week, with one day rest in seven; adequate meal and rest periods; proper safeguards for health and safety; and the same wage rates for women as for men.

Agencies recommending these principles were the War, Navy, and Labor Departments, Maritime Commission, War Manpower Commission, War Production Board, Office of Defense Transportation; the Public Health Service, and the Commerce Department also concurred in similar recommendations.

In general terms it may be stated that in most of the States legislation to provide adequate hours and conditions of work for women, the laws enables exceptions to be made for emergency conditions; in others, such exceptions have been allowed by responsible authorities, sometimes in great numbers. For example, a recent New York report showed that such dispensations applied to over 229,000 women in nearly 2,200 war plants, usually permitting night work or hours beyond 48 a week. Nevertheless, in many cases, where such relaxations of the laws have been allowed, strong efforts have been made to assure that these exceptions will be temporary, by providing rigid permit requirements and prior investigations of each case, and applying the exemptions to bona fide war workers under general powers, either express or implied. Since the outbreak of war a considerable number of States have passed emergency acts specifically authorizing the governor or director of labor to permit relaxation of labor laws.

only, or to extreme emergencies due to shortage of personnel, or to special need for particular skills requiring considerable training periods, and the like. In many cases, too, discussions with employers have convinced them that their demands were inconsistent with their own longer-time requirements for efficient production, and their requests were withdrawn.

More serious are the relaxations written into the hour laws of some 14 States that have amended their hour laws to provide relaxations include: Arkansas, California, Delaware, Illinois, Indiana, Maine, Montana, New Hampshire, North Dakota, Ohio, Tennessee, Texas, Utah, Wyoming.

Some of these nullify gains hard-won through long years. A rigid adherence to the best work standards has, in fact, been relaxed in many instances, and there must be a speedy return to them immediately after the war. The post-war economy will require a rapid shortening of hours, which will restore the more normal leisure time necessary for workers' health and well-being. For many months past, there has been considerable evidence that the burden of over-long hours is taking a heavy toll of the energy and health of women workers. Frequent reports by the agents of the Women's Bureau from various sections of the country indicate that in many war plants women workers are becoming fatigued much beyond the efficiency point.

Over-long hours also cause an increased absence rate. A recent New York report showed the rate of absence definitely higher with a 6-day rather than a 5- or 5½-day week, and higher also when lunch periods and rest periods were inadequate.

It is especially important in war time, when peak production is required, that conditions of work forestall excessive fatigue, and provide the workers with sufficient time for the necessary business connected with living. Women workers particularly require this, because they usually have very definite and time-taking

household responsibilities in addition to those of their paid employment--responsibilities that war-time conditions make unusually difficult and time consuming.

EQUAL PAY

A major problem in a labor force being rapidly expanded with women workers is the maintenance of wage standards. Important at all times, equal pay on the job without regard to the worker's sex becomes all the more pressing in such a period as this. It little furthers our cause if men return from the armed forces to find the standards of their wage broken down, or if women find themselves unable to obtain a living wage even though they are exerting their fullest effort to serve their country on the production line.

This is no new problem. Unions have recognized the equal pay principle as a safeguard to wage standards, and many of their agreements now include clauses providing for it. Government policy for equal pay has been expressed repeatedly by various agencies over a long period of years. The earlier War Labor Board of World War I announced it, and applied it in more than 50 case decisions. The present War Labor Board went much further in the General Motors case, defining equal pay to exclude the reduction of women's pay standards by slight alterations that make job organization more efficient. Owing to many technicalities, and to peculiar circumstances in many cases, the ideal ~~still~~ thus is not ~~fully~~ yet attained, but real progress has been made, both in definition of the problem and in attitude toward it. The Board's directives seeking to hold wages against an inflationary spiral, still make allowance for adjustments where women's wages have been below the rate for the job. The level of women's wages this year is above that of last year, but they still are less than 60 percent of men's; they are not so near to men's wages, as they were after the old N.R.A. had raised ~~the~~ women's wage levels.

See our Equal Pay Bul.

Based on Bu. of Labor Statistics Sept. 1943 Table

The progress in public understanding of the importance of equal pay is attested to by the fact that Illinois and Washington added themselves to Michigan as States with laws providing for equal pay. A notable decision of the Michigan Supreme Court upheld the law in that State, and afforded the requisite back pay to women. ~~to a large number of women workers in General Motors employ.~~

The Association's Minimum-Wage Committee will discuss pay questions in more detail.

THE FUTURE

Of course our great primary purpose in America at the present time is to win the war. And in that, I say to you that every bit as important as the flying of a Fortress, the taking of an enemy entrenchment, or the sinking of a battleship is the work of those women as well as men who measure the accurate instruments or carefully grind or inspect the small metal parts for that Fortress, who heat treat the metal or test the guns of those soldiers, or pack the cartridges for their belts. To win the objectives of this war we must bring the Four Freedoms to these workers. We must enable the needy woman worker as well as the man worker and the soldier, first to tide over the period of transition, and second to obtain work in the rebuilt peace economy.

Many of the 5 million women who are now employed in addition to those formerly in the labor market will ~~gladly~~ glad to return to their homes after the war. Others can not do so, but must remain permanently in the labor market. They have helped enormously in the vast war-production program, carrying along month after month the tedious factory regime and essential civilian services. Even before this time, large proportions of employed women supported dependents. The war casualties already have increased these burdens on women workers. Their needs,

like those of other workers, must be met in the post-war transition period.

Wage cuts and dismissals must not be permitted to affect women more drastically than other workers.

Technicalities in Unemployment Compensation, in no wise related to the performance or needs of the worker, must not be allowed to cut women off from just benefits.

Seniority provisions must not be allowed to militate unduly against women.

These are but a few of the policies that must be prepared for by present action. Workers--women as well as men--must be tided over the transition period and helped to find future jobs. Only thus can we establish the victory within our own economic system.

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With the rapid movement of recent events, it seems incredible that at our last meeting two years ago, we still spoke in terms of "defense." One of the most striking occurrences during this time has been the ready response of women to their country's call to work--in factory, mill, transportation system, restaurant, store, laundry, office, mine, lumber camp, and on the farm.

WOMEN'S NEW EMPLOYMENT

Latest available labor force figures show over 17 million women employed. This adds at least a third to the greatest number of women ever before in the labor force in the history of this country. With shortage of manpower becoming acute in an increasing number of areas, the Chairman of the War Manpower Commission decreed a year ago that "Every effort is to be made to recruit and refer women, including older women, for employment or training on the basis of their qualifications." Since the Spring of 1942, women have constituted more than four-fifths of the increases in factory workers. By June of 1943, in the production of the basic war materials alone, nearly 2 million women were at work.

The question of informing employers as to the work women could do and the conditions effective for their employment has become continually more pressing. In order to determine where and how women could work best, the Women's Bureau made intensive surveys of the jobs suited for their performance in various war industries--in the making of aircraft, guns, ammunition, instruments, ships, machine tools. The need for such surveys and their valu has been increasingly evident as employers newly faced with the problem of adding more and more women to their forces repeatedly have called for advice of all types.

In the Spring of 1941, for example, scarcely 150 women factory workers were employed in seven major aircraft assembly plants visited by Women's Bureau agents. Employers were not greatly interested. Six months later, when even before Pearl Harbor it had become evident that the male labor force would be depleted, and when they were being pressed to employ women, these same aircraft employers were eager to seek the advice of our agents, not only as to the kinds of jobs women could do, and hazards on certain work, but as to policies on a long series of knotty problems, the solution of which was well known to us but unfamiliar to those who formerly had not supervised many women--for example, as to pay rates on various jobs, effective training plans, provision of dressing rooms, approved standards for protective work clothing, night work and suitable arrangement of work shifts, policies regarding employment of married women, personnel policies best suited to adapting women to the factory routine, and so forth. Today more than 300,000 women help make airframes, gliders, engines, and propellers.

Following later, the commercial shipyards, having only 2,400 women wage earners in June 1942, within a year were employing more than 88,000.

Other industry groups employing women also have shifted, in adjustment to war needs, showing enormous increases in the numbers and proportions of women in machine industries, and in all types of war manufacturing. For example, in the Spring of 1941 iron and steel industries employed 93,000 women, in June 1943 they employed over 317,000. In the same period of approximately two years, woman employment had increased in electrical machinery plants from 131,000 to more than 323,000 women; in machinery except electrical from 43,000 to 240,000 women, in chemicals from 59,000 to 231,000 women, in rubber from 42,000 to 71,000 women.

Women advanced from 8.5 percent of the wage-earners producing durable goods in the Spring of 1941 to 22 percent in June 1943, from 3 to 27 percent of those making firearms, from 1 to 13 percent of those in machine-tool plants, from 47 to 57 percent of the wage-earners making boots and shoes, from 14 to 49 percent of those making professional and scientific instruments.

head back

KEEPING UP WORK STANDARDS

Many of the Labor Commissioners present recall only too vividly that first sudden impact of the vigorous demand for a breakdown of State laws affecting women, and the beginnings of their own valiant labors to uphold, so far as they were able, the work standards known as best to assure human welfare and efficiency on the job. These efforts of State Commissioners were vigorously supported by Federal agencies, seven of which immediately joined in recommendations re-stating the outlines of such standards, which are so important that they again should be summarized here for our record:

> A maximum work period of not more than 8 hours a day and 48 hours a week, with one day rest in seven; adequate meal and rest periods; proper safeguards for health and safety; and the same wage rates for women as for men.

Agencies recommending these principles were the War, Navy, and Labor Departments, Maritime Commission, War Manpower Commission, War Production Board, Office of Defense Transportation; the Public Health Service, and the Commerce Department also concurred in the recommendations on hours of work.

In general terms it may be stated that in most of the States legislation regulating hours and providing adequate conditions of work for women enables exceptions to be made for emergency conditions; in some other States, such exceptions have been allowed by responsible authorities. Since the outbreak of war a considerable number of States have passed emergency acts specifically authorizing the Governor or director of labor to permit relaxation of labor laws.

In many of these cases, strong efforts have been made to assure that the exceptions will be temporary, by providing rigid permit requirements and prior investigations of each case, issuing permits for limited periods, and applying the exemptions to bona fide war workers only, or to extreme emergencies due to

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shortage of personnel, or to special need for particular skills requiring considerable training periods, and the like. In many cases, too, discussions with employers have convinced them that their demands were inconsistent with their own longer-time requirements for efficient production, and their requests were withdrawn. Nevertheless, a recent New York report showed that such dispensations, over an 18-month period, applied to over 229,000 women in nearly 2,200 war plants, usually permitting night work or hours beyond 48 a week. Similarly, in California laws have been relaxed for 1,100 firms, roughly two-thirds of them during 1943.

Even more serious are the relaxations effected in some States by legislation setting aside or raising the maximum on hours of work.

Some of these nullify gains hard-won through long years. A rigid adherence to the best work standards has, in fact, been relaxed in many instances, and there must be a speedy return to them immediately after the war. The post-war economy will require a rapid shortening of hours, which will restore the more normal leisure time necessary for workers' health and well-being. For many months past, there has been considerable evidence that the burden of over-long hours is taking a heavy toll of the energy and health of women workers. Frequent reports by the agents of the Women's Bureau from various sections of the country indicate that in many war plants women workers are becoming fatigued much beyond the efficiency point; some are so exhausted they are quitting the job entirely.

Over-long hours also cause an increased absence rate. A recent New York report showed the rate of absence definitely higher with a 6-day rather than a 5- or 5½-day week, and higher also when lunch period and rest periods were inadequate. Similar situations are found wherever absence causes are investigated.

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Even more serious are the relaxations effected during 1943 by legislation setting aside or raising the maximum on hours of work in some 16 States, most of them major industrial States, and practically all having important war plants. In 7 of these States the 1943 war-time acts (in one case a proclamation) provide no maximum limit to daily or weekly hours.

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The level of women's wages this year is above that of last year, but they still are less than 60 per cent of men's; they are not so near to men's wages as they were after the old N.R.A. had raised the wage levels of women.

Owing to many technicalities, and to peculiar circumstances in many cases, the ideal thus is not yet attained, but real progress has been made, both in <u>definition of the problem</u> and in <u>attitude toward it</u>. The Board's directiveness seeking to hold wages against an inflationary spiral still make allowance for adjustments where women's wages have been below the rate for the job.

WOMEN IN INDUSTRY

A report to the Annual Meeting of the

INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

October 8 - 10, 1943

Chicago, Illinois

(LS 44-943)

WOMEN IN INDUSTRY

With the rapid movement of recent events, it seems incredible that at our last meeting two years ago we still spoke in terms of "defense". One of the most striking occurrences during this time has been the ready response of women to their country's call to work -- in factory, mill, transportation system, restaurant, store, laundry, office, mine, lumber camp, and on the farm.

Women's New Employment

Latest available labor force figures show over 17 million women employed. This adds at least a third to the greatest number of women ever before in the labor force in the history of this country. With shortage of manpower becoming acute in an increasing number of areas, the Chairman of the War Manpower Commission decreed a year ago that "Every effort is to be made to recruit and refer women, including older women, for employment or training on the basis of their qualifications." Since the Spring of 1942, women have constituted more than four-fifths of the increase in factory workers. By June of 1943, in the production of the basic war materials alone nearly 2 million women were at work.

The matter of informing employers as to the work women could do and the conditions effective for their employment has become continually more pressing. In order to determine where and how women could work best, the Women's Bureau made intensive surveys of the jobs suited for their performance in various war industries — in the making of aircraft, guns, ammunition, instruments, ships, machine tools. The need for such surveys and their value has been increasingly evident as employers newly faced with the problem of adding more and more women to their forces repeatedly have called for advice of all types.

In the spring of 1941, for example, scarcely 150 women factory workers were employed in seven major aircraft assembly plants visited by Women's Bureau agents. Employers were not greatly interested. Six months later, when even before Pearl Harbor it had become evident that the male labor force would be depleted, and when plants were being pressed to employ women, these same aircraft employers were eager to seek the advice of our agents, not only as to the kinds of jobs women could do, and hazards on certain work, but as to policies on a long series of knotty problems, the solution of which was well known to us but unfamiliar to those who formerly had not supervised many women -- for example, as to pay rates on various jobs, effective training plans, provision of dressing rooms, approved standards for protective work clothing, night work and suitable arrangement of work shifts, policies regarding employment of married women, personnel policies best suited to adapting women to the factory routine, etc. In June 1943 more than 322,000 women helped to make airframes, gliders, engines, and propellers.

Beginning later to take on women, the commercial shipyards, having only 2,400 women wage earners in June 1942, within a year were employing more than 88,000.

Other industry groups employing women also have shifted, in adjustment to war needs, showing enormous increases in the numbers and proportions of women in machine industries, and in all types of war manufacturing. For example, in the spring of 1941 iron and steel industries employed 93,000 women; in June 1943 they employed over 317,000. In the same period of approximately two years, woman employment had increased in electrical-machinery plants from 43,000 to 240,000 women, in chemicals from 59,000 to 231,000 women, in rubber from 42,000 to 71,000 women.

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Women advanced from 8.5 percent of the wage earners producing durable goods in the spring of 1941 to 22 percent in June 1943, from 3 to 27 percent of those making firearms, from 1 to 13 percent of those in machine-tool plants, from 47 to 57 percent of the wage earners making boots and shoes, from 14 to 42 percent of those making professional and scientific instruments.

In the Detroit area a large group of war plants employed 35,800 women a year ago, and 120,000 women last spring.

In Illinois, over the 3-year period since 1940, there was an increase of 81 percent in numbers of women wage earners employed in all manufacturing establishments reported, 170 percent in metals and machinery; men's employment also had increased considerably.

In California, during the past year's time the proportion of women rose from 6 to 23 percent of the wage earners in plants making durable goods, from 4 to 18 percent in iron and steel plants, from 27 to 45 percent in rubber plants.

In New York, machinery and electrical plants having last year a wage-earner force with 14 percent women, have this year 23 percent women.

Recruitment of Women

Naturally with the addition of some 5 million women to the labor force since 1940, their recruitment has engaged much of the attention of the War Manpower Commission, where the duty to supply workers centers. This agency created a Women's Advisory Committee, which recommended that employers analyze occupations and promote use of women, and that management and labor remove all barriers to their employment.

The whole-hearted response of women to the demand for their work, and the fact that already many have been laid off, both point to the wise decision that, at least up to the present, no compulsory registration of women has been either necessary or desirable. In taking this position, the War Manpower Commission has defined the areas of acute labor shortage. In such areas, if efforts toward individual recruitment of women have been tried and found insufficient, voluntary enrollments of women are permitted, provided that employers have agreed that they can at once employ many women; it is shown that workers are being effectively used and that the shortage therefore is a real one; there is evidence of a local supply of woman labor with control of outside migration; and the work standards that I shall later refer to are observed.

A large number of communities with bona fide labor shortages have taken advantage of these voluntary enrollments. Recent months have seen layoffs in a number of communities, and the need for an enrollment of women on a National scale is not evident at present. Nor will it be, so long as we still have some unemployed women, nor until we have the assurance, now often lacking, that women workers are being effectively used on the job.

Keeping up Work Standards

Many of the Labor Commissioners present recall only too vividly that first sudden impact of the demand for a breakdown of State laws affecting women, and the beginnings of their own valiant labors to uphold, so far as they were able, the work standards known as best to assure human welfare and efficiency on the job. These efforts of State Commissioners were vigorously supported by Federal agencies, seven of which joined in recommendations restating the outlines of such standards, which are so important that they again should be summarized here for our record:

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Agencies recommending these principles were the War, Navy, and Labor Departments, Maritime Commission, War Manpower Commission, War Production Board, and Office of Defense Transportation; the Public Health Service and the Commerce Department also concurred in the recommendations on hours of work.

In general terms it may be stated that in most of the States legislation regulating hours and providing adequate conditions of work for women enables exceptions to be made for emergency conditions; in some other States, such exceptions have been allowed by responsible authorities. Since the outbreak of war a considerable number of States have passed emergency acts specifically authorizing the Governor or director of labor to permit relaxation of labor laws.

In many of these cases, strong efforts have been made to assure that the exceptions will be temporary, by providing rigid permit requirements and prior investigations of each case, issuing permits for limited periods, and applying the exemptions to bona fide war workers only, or to extreme emergencies due to shortages of personnel, or to special need for particular skills requiring considerable training periods and the like. In many cases, too, discussions with employers have convinced them that their demands were inconsistent with their own longer-time requirements for efficient production, and their requests were withdrawn. Nevertheless, a recent New York report showed that such dispensations, over an 18-month period, applied to over 229,000 women in nearly 2,200 war plants, usually permitting night work or hours beyond 48 a week. Similarly, in California laws have been relaxed for 1,100 firms, roughly two-thirds of them during 1943.

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Some of these legal changes nullify gains hard-won through long years. In short, rigid adherence to the best work standards has been relaxed in many instances, and there must be a speedy return to them immediately after the war. The post-war economy will require a rapid shortening of hours, which will restore the more normal leisure time necessary for workers' health and well-being. For many months past, there has been considerable evidence that the burden of over-long hours is taking a heavy toll of the energy and health of women workers. Frequent reports by agents of the Women's Bureau from various sections of the country indicate that in many war plants women workers are becoming fatigued much beyond the efficiency point; some are so exhausted they are quitting the job entirely.

Over-long hours also cause an increased absence rate. A recent New York report showed the rate of absence definitely higher with a 6-day rather than a 5- or 5½-day week, and higher also when lunch period and rest periods were inadequate. Similar situations are found wherever absence causes are investigated.

It is especially important in wartime, when peak production is required, that conditions of work forestall excessive fatigue, and provide the workers with sufficient time for the necessary business connected with living. Women workers particularly require this, because they usually have very definite household responsibilities in addition to those of their paid employment -- responsibilities that wartime conditions make unusually difficult and time consuming.

Equal Pay

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This is no new problem. Unions have recognized the equal-pay principle as a safeguard to wage standards, and many of their agreements now include clauses providing for it. Government policy for equal pay has been expressed repeatedly by various agencies over a long period of years. The earlier War Labor Board of World War I announced it, and applied it in more than 50 cases. The present War Labor Board went much farther in the General Motors case, defining equal pay to exclude the reduction of women's pay standards by slight alterations that make job organization more efficient.

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The progress in public understanding of the importance of equal pay is attested to by the fact that Illinois and Washington added their names to that of Michigan as States with laws providing for equal pay. A notable decision of the Michigan Supreme Court upheld the law in that State, and afforded the required back pay to women.

The Association's Minimum-Wage Committee will discuss pay questions in more detail.

The Future

Of course our great primary purpose in America at the present time is to win the war. And in that, I say to you that every bit as important as the flying of a Fortress, the taking of an enemy entrenchment, or the sinking of a battleship is the work of those women as well as men who measure the accurate instruments or carefully grind or inspect the small metal parts for that Fortress, who heat-treat the metal or test the guns of those soldiers, or pack the cartridges for their belts. To win the objectives of this war we must bring the Four Freedoms to these workers. We must enable the needy woman worker as well as the man worker and the soldier, first to tide over the period of transition, and second to obtain work in the rebuilt peace economy.

As I have stated, 5 million women are now employed besides those formerly in the labor market. Many of these will be glad to return to their homes after the war. Others cannot do so, but must remain permanently in the labor market. They have helped enormously in the vast war-production program, carrying along month after month the tedious factory routine and essential civilian services. Even before this time, large proportions of employed women supported dependents. The war casualties already have increased these burdens on women workers. Their needs, like those of other workers, must be met in the post-war transition period.

Where cut downs in force of workers become necessary, equitable plans must be worked out so that the effects do not fall more heavily on women than on other workers.

Technicalities in unemployment compensation, in no way related to the performance or needs of the worker, must not be permitted to cut women off from just benefits.

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These are but a few of the policies that must be prepared for by present action. Workers -- women as well as men -- must be tided over the transition period and helped to find future jobs. Only thus can we establish the victory within our own economic system.

International Association of Governmental Labor Officials 57

Minimum-Wage Legislation in the United States

September 1941 to September 1943

Three months after this Association held its meeting in September 1941 the country was at war. During the past two years our entire economy has been dominated by our war program. To consider the course of labor legislation during this period without relation to the war is as impossible as to discuss the food supply, gasoline, or the manpower problem separate from the war demand. The substance, administration, or practical application of most of our labor laws has been affected in some way by the war. Changes in policy or administration that are taking place today are not only of present significance, but may indicate future trends that will project into the post-war period.

Minimum-wage legislation is a field in which the effects of the war have been both positive and negative. Negative, inasmuch as during 1942 and 1943 no new legislation was adopted. At the 1941 meeting of this Association, State minimum-wage administrators expressed the fear that the nation-wide publicity then being given to the high wages paid to defense workers would blind the public to the fact that thousands of workers in other industries were being paid appallingly low wages. Low wages are still common in spite of the public's growing conviction that all workers are earning fabulously high amounts. The Women's Bureau and State labor departments continue to receive letters, usually from women, complaining that the writers cannot possibly live on the wages they make in laundries, stores, and other service industries. As would be expected, the majority of these letters come from States that do not have minimum-wage laws. State legislators apparently shared the general impression that low wages are not an immediate problem and concluded that legislative action is not required at this time. Fewer minimum-wage bills were introduced in the legislatures

this past year than usual and none was passed.

Any impression that low wages are strictly a depression phenomenon and that minimum-wage legislation benefits workers only when "times are bad" is certainly not based on facts, as can be shown by the enforcement experience of any State minimum-wage agency. The experience of New York and California will suffice to illustrate that even in times as prosperous as the present, thousands of women are paid substandard wages and doubtlessly would continue to be so paid if it were not for minimum-wage laws. During 1942 and the first 6 months of 1943 the Division of Women in Industry and Minimum Wage of the New York State Department of Labor collected $224,477 ($174,326.88 + $50,150.31) from 7,464 (5,871 + 1,593) establishments which had paid more than 20,000 women less than the legal minimum wage. These figures are especially shocking when one realizes that none of the 6 orders under which this underpayment was collected provides for a minimum wage of more than 36.7 cents an hour. For the same 18-month period the Division of Industrial Welfare of California collected unpaid wages amounting to $419,455.

We all know that enormous sums have been collected for the workers under the Fair Labor Standards and Public Contracts Acts during this war period. Under these two laws during the fiscal year of 1943 employers paid or agreed to pay to underpaid employees $16,778,760, while in 1942 the amount of restored wages was $20,918,670.

Wage restitutions effected under the Federal laws furnish less significant evidence of low wage rates, however, than do the State minimum-wage collections, inasmuch as a large proportion of the underpayments under the Fair Labor Standards and Public Contracts Acts are due to failure to pay time and one-half

the employees' regular rates of pay rather than failure to pay the basic minimum hourly rates.

The war has had one positive effect on minimum wage administration which one might wish were more general among the States. Most State minimum wage laws provide that minimum wages shall be sufficient to meet the necessary cost of living of women workers. In spite of the Government's efforts to control the cost of living during the war period, average prices in the United States have increased by 25 percent since war broke out in Europe in the summer of 1939. Minimum wage rates established before the outbreak of the war may have been adequate to meet living costs at the time the orders were issued, although all minimum-wage administrators know that seldom does a ~~minimum~~ wage board recommend a wage equal to the ~~minimum wage~~ budget prepared by the State labor department as representative of what it costs a woman worker to live. Whether wage rates set several years ago were or were not adequate when adopted, certainly they are inadequate today to meet living costs which have risen by 25 percent. Some States have taken steps to correct the discrepancy between living costs and legal minimum wages. California has done the most complete job in this respect of any of the States. In the past year and a half the Industrial Welfare Commission of California has revised all previously adopted orders and issued new orders for three industries not formerly covered. All of the revised orders provide for a minimum wage of $18 for a 40-hour week. The three new orders for transportation, amusement and recreation, and industries handling farm products after harvest - the last three to be adopted - provide for a $20 wage for a 40-hour week. Twenty dollars represents an increase of exactly 25 percent over the earlier California minimum wage of $16.

9. Orders issued or revised between Sept. 1, 1941 and Sept. 1, 1943.

Date	New no.	New States	Revised no.	Revised States
Sept. 1, 1941 – Jan. 1, 1942	1	Washington – Office Jan. 1, 1942 effective date	1	Ky. – Sales, Nov. 1, 1941
Jan. 1, 42 – Dec. 31, 42	3	Conn. (1) mercantile N.J. (2) beauty R.I. (3) restaurant	18 → 43	Calif. – (1) Manuf. (2) Business service (3) Canning Ky. (4) Hotel + Rest. Mass. (5) Candy (6) Beauty N.H. (7) Beauty N.J. (8) Apparel Oregon (9) Canning – fruit + veg. (10) Fruit + veg packing
Jan. 1, '43 – Sept. 1, '43	5	N.J. (1) Restaurants Pa. (2) Restaurants Calif – (3) Farm products (4) Transportation (5) Amusement	4	Calif. – (1) Mercantile, (2) Sales (3) Public housekeeping (4) Clerical
Total	9	6	23 1 22	8 1 7

Total states that have issued or revised upward orders = 10
South Dakota 1
11

Orders issued or revised between Sept 1, 1941 and Sept. 1, '43

~~Date~~ Revised

Sept. 1, 41 - Jan. 1, 42.

New	Revised
1. Washington	(1. Calif)
2. Conn	2. Ky
3. N. J.	3. Mass
4. R. I.	(4. N. H.)
5. Pa	(5. N. J.)
6. Calif	6. Oregon
	(7. Washington)
	8. Mis.

Seven States since September 1941 have raised the minimum wages for thousands of women workers by revising upward the rates established by 22 wage orders. South Dakota by legislative action increased the statutory minimum for that State from $12 a week to $15. In addition, 6 States issued 9 wage orders for occupations previously not covered by such orders. In all, 11 States have raised minimum-wage standards for at least part of the employed women in their States since the United States entered the war. However, more than half the States have neither issued new orders nor revised old ones during this period of drastically rising prices. Few wage orders issued before 1939 provide for basic minimum hourly rates of more than 35 cents. Today, because of the rise in living costs, 44 cents would be required to buy what could have been bought with 35 cents before the war. Moreover, workers even at the minimum-wage level must now pay income taxes. Unless some adjustment is made in the legal wage, the purchasing power of many is reduced far below that which is necessary to maintain anything approaching an adequate standard of living.

The National War Labor Board, which is charged with the obligation of stabilizing wages in order to prevent inflation, has declared any wage below 50 cents substandard in certain areas of the country. Moreover, the Board has given blanket approval of all wage increases made in compliance with State minimum-wage orders that do not bring wage rates above 50 cents an hour. The establishment of minimum-wage rates as high as 50 cents an hour would not be out of harmony with the anti-inflation program.

Dec'. 1941 – Aug. 31: 1941.

new –		Revised	
State –	Ind.	State	– Industry
(?) ←		Conn. (Mar 1941)	– Beauty
		Ill. (Mar. 1941)	– Beauty
Mass. ✓	– Office (Aug. '41) Restaurants (Sept. '41)	~~Mass~~	~~Office Restaurants~~
		~~Ind~~	
~~Oregon~~	– ~~Beauty (?)~~	Oregon	– ~~Canning fruit + veg~~ ~~Slemming clerics~~
Utah	Ldry. (June '41) Hotels + rest. (July 14 '41)		~~Fruit + veg.~~ ~~fishing~~ Beauty Hospitals Ldry. Manuf. Mercantile Office Personal serv. Public house keeping Telephone

New.	Revised
Washington	✓ Ky.
✓ Conn.	✓ Conn.
✓ New Jersey.	✓ N. J.
✓ R. R.	
✓ Pa.	
✓ Calif.	✓ Calif.
✓ Mass.	✓ Mass.
Utah.	
	N. H.
	✓ Ill.
	Oregon
	Va.

In 1941 we reported that Puerto Rico had passed a new minimum-wage law covering both men and women. On the recommendations of minimum-wage committees, composed of representatives of employers, employees, and the public, the administrative agency may establish minimum-wage rates, maximum working hours, and standard labor conditions. During 1943 wage orders were issued for three industries, leaf tobacco, sugar, and hospitals, clinics, and sanatoriums. The provisions of these orders are extremely interesting. Two orders provide that double time shall be paid for hours in excess of 8 a day. Employers in the leaf-tobacco industry are required to provide suitable rooms in which workers may eat; cold, filtered water must be furnished; and rooms with mild temperature where workers may change their clothes before going outside. Ditch-diggers working in water in the sugar fields must be provided with boots, and gloves must be furnished portable-track handlers. The weight of bags of sugar that may be lifted by workers is limited. Deductions may not be made for meals, and rents charged for company houses are regulated in the order for the sugar industry. A unique provision of the order for this industry is coverage of workers in the agricultural branch as well as in the industrial branch of the industry. These orders represent remarkable progress, and Puerto Rico is to be congratulated on the standards that have been established.

The Wage and Hour Division of the United States Department of Labor has made rapid progress since this Association last met in September 1941, in establishing the 40-cent minimum wage permitted under the Fair Labor Standards Act for workers covered by that law. Since our 1941 meeting, 16 orders have become effective for industries not before covered by such orders, while 14 orders have revised previously established minima to 40 cents. All wage orders now in effect provide for a 40-cent minimum except for two industries (lumber and clay products) and parts of two other industries (straw hats and cigar types of leaf tobacco). For all of these, recent industry committees have recommended a 40-cent minimum.

By August 31, 1943, a total of 66 industry committees had met since the Fair Labor Standards Act became effective in October 1938, and had recommended minimum wages for industries with almost 18 million employees. With one exception ~~(the cigar industry committee, meeting on December 12, 1941, which recommended 35 cents for cigar types of leaf tobacco and 40 cents for cigars)~~, each of the 33 industry committees which have convened since our last meeting have recommended a 40-cent minimum for the entire industry under consideration.

The ~~future~~ present program of the Wage and Hour Division ~~foreshadows~~ indicates that, far in advance of October 1943 when a 40-cent minimum would be required under any circumstances, the Division will have established a 40-cent minimum for all employees in continental United States who are covered by the Fair Labor Standards Act. In September 1943, four additional orders, all providing for 40-cent minimum wages, will become effective. For eight additional industries, committees have recommended a 40-cent minimum, on which administrative decision is pending. Five additional industry committees will meet in September and October, to recommend minimum wages for all remaining employees in continental United States who are subject to the Fair Labor Standards Act.

17 Minimum-wage standards for workers covered by the Public Contracts Act also have been raised during the war period. Wage orders for 24 industries either have been issued for the first time since September, 1941, or have been revised to provide higher wage rates or more extensive coverage. The rates established by these orders range from 32½ cents for processors of evaporated milk in certain States to 67½ cents for manufacturers of men's hats and caps.

for the processing of ?
for the (mfrs) of ?

The policy of the National War Labor Board in respect to wage increases made in compliance with State minimum-wage laws and orders has gone through several stages. The negotiations which have continued for almost a year between the Women's Bureau of the United States Department of Labor and the War Labor Board to secure a policy satisfactory to the States would have been unnecessary if Title VI of Executive Order No. 9250, the President's Order to stabilize the cost of living, had been more inclusive. Order No. 9250 provides that no wage increases or decreases shall be made without War Labor Board approval. The first paragraph of Title VI stipulates, however, that "Nothing in this order shall be construed as affecting the present operation of the Fair Labor Standards Act, the National Labor Relations Act, the Walsh-Healey Act, the Davis-Bacon Act, or the adjustment procedure of the Railway Labor Act." Unfortunately, no reference was made in this section to State minimum-wage laws.

After the Women's Bureau called to the War Labor Board's attention this omission and the fact that the purpose of State minimum-wage laws is the same as that of the Fair Labor Standards Act, namely, to eliminate substandards of living, the Board on October 31, 1942, issued General Order No. 7 giving blanket approval to all wage increases made in compliance with State minimum-wage laws and orders. This seemed a happy solution to the problem and State labor departments continued as usual to issue wage orders without reference to the National Board. ~~Suddenly~~ On April 19, 1943, the Board announced that General Order No. 7 had been amended, and that henceforth no wage increases made in compliance with State wage orders issued after April 8, 1943, could be made without board approval. This sudden change in policy was difficult

to understand until it was discovered that a State in which a serious manpower shortage exists contemplated issuing an order establishing a minimum wage of 70 cents an hour for women in the canning industry. The War Labor Board feared the inflationary effects of minimum wages as high as 70 cents. To prevent similar rates' being established by other States, Order No. 7 was amended. Considerable anxiety was felt lest the requirement that all wage increases made by order of State minimum-wage authorities must be approved by the War Labor Board discourage the issuing of new State orders or the upward revision of outmoded rates. The Women's Bureau therefore requested the Board to rescind the amendment of April 19 or, if that procedure was unacceptable, to substitute for the amendment one of several proposals made by the Bureau. The result was amended General Order No. 7 as adopted by the Board August 2, 1943. The order as revised gives blanket approval to all wage increases made in compliance with State minimum-wage laws and orders when such increases do not result in rates above 50 cents an hour. Part-time and overtime rates higher than 50 cents are also approved. This policy leaves State minimum-wage administrators free to establish such minimum-wage rates as conditions in their respective States demand, without referral to the Board, except in those cases where the basic minimum rate would be in excess of 50 cents an hour. The Board would ~~most~~ probably approve even the higher rates if the evidence supported the need for the establishment of such minimum wages.

Other Federal legislation has created administrative problems for State minimum-wage authorities. The Revenue Act of 1942 provided that a 5-percent victory tax be withheld from the wages of workers, and the Current Tax Payment Act of 1943 requires that 20 percent be deducted from wages for income taxes

payments. The current law applies, as did the 1942 Act, even to workers paid ~~only~~ at the minimum-wage level, providing wages are in excess of $12 a week. The term wages means all remuneration, whether in cash or goods, for services performed by an employee for his employer. It can readily be seen that deductions such as these greatly complicate the task of inspecting for compliance with minimum-wage orders. If meals are wages, who is to determine the value of meals as a basis for computing and deducting the tax? Must the tax be deducted from wages earned before the revenue acts were passed, but paid to the workers after the laws became effective, because violations of the minimum-wage law were discovered and restitution of wages ordered? These and similar questions have arisen and been referred by the Women's Bureau to the Bureau of Internal Revenue for reply. On these specific questions the Bureau has ruled that the value established for meals by State minimum-wage orders is acceptable as a basis for computing income taxes, and that wages earned before the tax laws became effective, but paid afterwards, are not subject to tax deductions. The requirements of the Federal revenue acts certainly have slowed up inspection and increased the work of State minimum-wage investigators.

State courts in two recent decisions have shown gratifying understanding of the purpose of State minimum-wage legislation and the importance of administrative regulations to safeguard wages and to assure the welfare of workers. The first of these decisions was rendered on December 3, 1942, by the highest court of the State of New York. The New York Court of Appeals upheld the principle of the guaranteed weekly wage, which has been incorporated in many wage orders in recent years and has benefited thousands of women. The New York wage order for the confectionery industry requires employers to pay $10 to employees working 3 days or less in any week during the busy season and $7 to employees working 2 days or less in any week during the slack season. The order provides, in other words, for a guaranteed weekly wage for part-time workers. The court recognized that the State labor department in adopting this order was attempting to cope with the problem of low wages that result from under-employment. In its decision the court said:

> The very concept of minimum-wage legislation necessarily involves the determination of the cost of living and the fixing of a wage that will reasonably cover, or approach, that cost. The idea of a "living wage" is the heart and core of all such legislation. * * *
>
> * * * It is fairly to be assumed that the Legislature, bent on seeing to it that women and minors should, so far as possible, receive subsistence wages for their work, appreciated that no hourly rate of wages could achieve that result unless it were multiplied by some appropriate number of hours.
>
> * * * The Legislature, driving toward its plainly marked goal, would have stopped far short of that goal if it had provided for minimum hourly wages only. The accomplishment of its high social purpose required a grant of authority to the Labor Department to make such orders as would in fact be directed toward providing a living wage, not merely an hourly rate which, in most industries, would not produce a living income, unless ordered paid for a sufficient minimum number of hours.

This is one of the most liberal decisions relating to minimum-wage legislation that has been rendered by any court. The constitutionality of minimum-wage legislation per se has been established by the United States Supreme Court. State courts gradually are coming to recognize the necessity and importance of administrative regulations in carrying out the true purpose of basic wage laws.

The second important minimum-wage decision to which we have referred was handed down June 16, 1943 by the Supreme Court of California. It relates to a problem which has troubled minimum-wage administrators for years, that is, the relation between tips and wages. When this Association last met, the United States Supreme Court had not yet ruled on the status of tips under the Fair Labor Standards Act. On March 2, 1942, however, in the case of Williams v. Jacksonville Terminal Company, the Supreme Court held that, under the "accounting and guarantee" plan present in that case, tips paid to red caps at railroad terminals may be treated as wages under the Fair Labor Standards Act. State administrators were greatly concerned about the possible effect of this decision on the administration of State minimum-wage orders that contain a provision that "In no event shall gratuities from patrons or others be counted as part of the minimum wage." The Solicitor of Labor, when consulted about this matter, stated that the Supreme Court in the red-cap case had dealt with a specific situation under the Fair Labor Standards Act, and had not passed on the legality of State regulations holding that tips are not wages.

It remained, therefore, for the Supreme Court of California to render the first decisive opinion concerning the validity of State regulations prohibiting the inclusion of tips in minimum wages. Section 3 of the California Industrial Welfare Order No. 12A for hotels and restaurants provided that:

> No employer may include tips or gratuities received by employees designated in Section 1 hereof as part of the legal minimum wage fixed by said section of this order.

The California Supreme Court declared that the restriction placed by Section 3 on employers' and employees' freedom to contract in relation to the disposition of tips is a legitimate exercise of the police power of the State. If employers were permitted to include tips in the minimum wage, employees might report tips in greater amounts than actually were received for fear of being dismissed. "The effectiveness of the minimum-wage law thus would be impaired." To insure receipt of the minimum wage and to prevent evasion and subterfuge, the power to provide safeguards is necessarily implied in the power to fix a minimum wage, the court declared.

This decision is binding, of course, only in the State of California. But as it is the first decision rendered by any State supreme court concerning the relation of tips to wages under State minimum-wage laws, it is indeed encouraging that it should have been in favor of accepted social practice in such situations. A constructive precedent has been established which will, without doubt, influence decisions in other States.

Your committee believes that the most urgent need at the present time in the field of State minimum-wage legislation is extension of coverage. Every effort in States without minimum-wage laws should be exerted to secure the passage of such legislation before this war is over. State laws with limited coverage should be amended to provide protection for all workers. The benefits of existing laws in many States could be greatly extended without legislative action if wage orders were issued for all occupations now covered by the laws. The committee urges the adoption of new orders and the revision

of unreasonably low rates at this time, first, because of the immediate protection such orders would give thousands of women workers, and second, because of the stabilizing effect that wage orders, if widely adopted, would have on our post-war economy. If States wait until wages begin to fall to establish minimum-wage rates, employers' resistance to the setting of minimum wages will be very much stiffened. ~~The Wage and Hour Division reports that employers who~~

Since
The experience of the Wage and Hour Division is striking.
convening
Every industry committee ~~meeting~~ in 1942 and 1943 has recommended a 40-cent minimum, ~~typically~~ with shorter meetings and larger majorities than occurred before the war when lower minima frequently were under consideration.

Moreover, the security that a legal minimum wage would afford might be of real assistance in the present drive to recruit women for employment in the service industries. The traditionally low wages that still prevail in these industries is one of the important reasons why women are deserting them for other employment and are not responding to the many urgent appeals to take jobs in laundries, restaurants, stores, and cleaning establishments. The National War Labor Board has given its sanction to minimum wages up to

The laws of Calif, Colo, Kans, Ore, Utah, Wash, and Wis do not exclude dom. serv. in the home. In addition, ~~to~~ Ore. does not excl. dom. S. in the home and neither does not exclude agric. labor. ? ? ? route?

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Sorry, I should have kept the one on p. 14

of unreasonably low rates at this time, first, because of the immediate protection such orders would give thousands of women workers, and second, because of the stabilizing effect that wage orders, if widely adopted, would have on our post-war economy. If States wait until wages begin to fall to establish minimum-wage rates, employers' resistance to the setting of minimum wages will be very much stiffened. The Wage and Hour Division reports that employers who before the war probably would have opposed vigorously raising minimum wages above 30 cents an hour, today are urging that 40 cents be adopted immediately. Industry committees today sit only a few hours before arriving at a unanimous decision in favor of a 40-cent minimum. In less prosperous times they have been known to meet for days, sometimes weeks, before agreeing on a wage as low as 32 or 34 cents an hour.

Moreover, the security that a legal minimum wage would afford might be of real assistance in the present drive to recruit women for employment in the service industries. The traditionally low wages that still prevail in these industries is one of the important reasons why women are deserting them for other employment and are not responding to the many urgent appeals to take jobs in laundries, restaurants, stores, and cleaning establishments. The National War Labor Board has given its sanction to minimum wages up to 50 cents. If States could immediately set rates for those service industries not yet covered, a real contribution to the war effort would be made.

It would also appear that this is a proper time for States that have minimum-wage laws covering domestic service and labor on the farm to pioneer in the field of setting rates for these occupations. Eight States' laws and those of Alaska and Puerto Rico do not exclude domestic service; 1/ The same number

1/ The laws of Alaska, California, Colorado, Kansas, Oklahoma, Oregon, Utah, Washington, and Wisconsin do not exclude domestic service in the home. Alaska, California, Colorado, Kansas, Nevada, Oregon, Utah, Washington, and Wisconsin do not exclude agricultural labor.

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~~of States~~ ~~and Alaska~~ ~~and Puerto Rico~~ cover agricultural labor. 1/ Domestic labor is at present so scarce that it is conceivable that housewives might be glad to cooperate with the State in establishing wage and working standards that would attract more women to this ~~occupation~~ employment. Legal minimum wages for the women who ~~are~~ now ~~being employed~~ work in considerable numbers on farms would be an important first step in establishing ~~work~~ standards for this occupation that hitherto has been entirely unregulated. States that have had the longest and most successful experience with the administration of minimum wage laws are among those whose laws cover domestic and farm workers. They would be in an exceptionally good position to experiment in this new field. So far ~~industry~~ only Wisconsin has issued a wage order for domestic workers in the home. ~~With the exception of the Puerto Rico order for the sugar~~ No orders covering agricultural workers have been adopted.

Those States that have postponed issuing wage orders, because of lack of staff or funds necessary to assemble the wage data required for wage boards' consideration, may find of ~~some~~ assistance the wage data currently collected by the Bureau of Labor Statistics, U. S. Department of Labor. For the use of the National War Labor Board, the Bureau of Labor Statistics is making surveys of wages in all communities of 25,000 population or more in the United States in both service and manufacturing industries. Ultimately every State in the Union will be included in this survey, and in certain

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1/ The laws of ~~Alaska~~, California, Colorado, Kansas, Oklahoma, Oregon, ~~Utah~~, Washington, and Wisconsin do not exclude domestic service in the home. ~~Alaska~~, California, Colorado, Kansas, Nevada, Oregon, ~~Utah~~, Washington and Wisconsin do not exclude agricultural labor.

wage rates (or straight time earnings) rather than gross eg.

special cases towns of less than 25,000 will be covered. Average hourly earnings are reported by occupation, sex, and community. These studies do not include all the wage data usually furnished wage boards or all that usually are required. They are sufficient, however, to indicate whether women are being paid substandard wages and the need for wage board action.

It is suggested, therefore, that minimum wage administrators contemplating the establishment of minimum wage boards consult the wage analysts of the appropriate regional offices of the B. L. S. to discover what data can be secured from this source that would be helpful in establishing minimum wages. Although the Federal Bureau of Labor Statistics may be unable to collect additional material to assist the State minimum wage authorities, it is possible that special tabulations of existing data might be prepared to meet the needs of the State.

All evidence indicates that now is the time for States to increase minimum wage activities. It is easier now than it will be later to establish desirable wage standards. The establishment of a bottom to wages at this time is a sound contribution to the efforts which must be made now to avoid economic disaster in the post-war period.

WOMEN IN INDUSTRY

A report to the Annual Meeting of the
INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

September 3-6, 1941

St. Louis, Missouri

WOMEN IN INDUSTRY
September 1940 to August 1941

WOMEN IN THE LABOR MARKET

The question as to how many women are employed in industry in the United States at present is still an open one.

Preliminary figures from the 1940 Census estimate the total number of women in the labor market for the various States as well as for the country as a whole, but as yet figures on occupational distribution are still not available. While these data are estimates from a 5-percent cross section of the complete data and may be changed later, and the basis of reporting differs in several respects from that of 1930, they indicate significant trends. A notable difference in reporting is the inclusion of job seekers with no experience in 1940 but not in 1930. Also, the figures are for those 14 years and over in 1940, 10 years and over in 1930.

In the decade from 1930 to 1940 the number of women in the labor market increased by about 2 million - from 10,750,000 to 12,750,000. The proportion of women among all the Nation's workers shows some increase also - now being 24.3 percent as against 22 percent in 1930. In general, however, the proportion of the entire woman population that is in the labor market differs very little from the former situation. In 1930, 24.3 percent of all women 14 and over were in gainful work; in 1940, 25.5 percent were in the labor market. The difference probably is little or no greater than could be explained by the inclusion of new workers seeking jobs in 1940 and the exclusion of such persons from 1930 data. In only one State, Delaware, is this difference considerable - 28.4 percent in 1940 as against 23.9 percent in 1930.

Comparison of the numbers of women in the 1940 labor market (including new workers) with the numbers gainfully occupied in 1930 (14 years and over in each year) shows the greatest increases in New York, California, Pennsylvania, Illinois, Texas, and New Jersey, adding respectively from 287,000 to 102,000 women workers. Over 50,000 were added in Michigan, Ohio, North Carolina, Florida, Virginia, and Missouri. The only State showing a decline in number of women workers is Mississippi, but in Alabama, Nevada, Wyoming, Arkansas, Utah, and Vermont the increase was so small that if the untrained youth were subtracted advance would be slight.

During the past year developments for women in industry have been influenced to such extent by the defense program that analysis of its effects on women workers is of foremost interest. Because of this situation the Women's Bureau has devoted a major part of its time and effort to defense problems and conditions as these relate to women. Such activities comprise:

1. Special investigations and analyses of women's share and role, present and potential, in defense industries, such as aircraft, small arms and artillery ammunition, and so on.

2. Two conferences, one in November on women's training needs for defense employment, attended both by the regular Women's Bureau Advisory Committee and its special Labor Advisory Committee, and the other in June attended by the Labor Advisory Committee to discuss the progress of defense work as it relates to women and to formulate a program for future activities.

3. Services as consultants to the War Department, the Office of Production Management, the Office of Education, the National Youth Administration, State departments of labor, private industry, and union groups concerned with specific problems connected with women on defense production.

4. Published reports on standards, on findings of the defense-plant surveys, and so forth.

5. Day-by-day scrutiny of legislative developments affecting women workers.

WOMEN'S JOB CHANCES IN DEFENSE AND OTHER WORK

Some of the major developments with regard to the employment of women on defense and other jobs within recent months are noted as follows:

1. Women are receiving a share of employment in the rapidly increasing defense industries. Visits made by a Women's Bureau agent in October and again in February to certain New England munitions and airplane factories showed that in some of these the force of women had increased by about 50 percent, in some it had doubled. In several plants combined, where some 2,600 women were employed in October, over 4,500 were at work in February. A recent estimate shows that of 15 plants with defense contracts, over 25,000 women will be needed in the near future.

2. While placements of women in 400 defense occupations constitute only about 1 percent of the total for the early months of 1941, according to tabulations of the Bureau of Employment Security, such placements were more than three times as great as in the late months of 1940. Of these new jobs, 60 percent were in textile mills, most of them as yarn winders, frame spinners, weavers, slubbers, and throwers - traditional employments for women. Some were in electrical plants as radio assemblers, or armature winders. A few were in less usual jobs, such as work at engine lathes, milling machines, or as core makers, spot welders, or airplane coverers. These data do not tell the whole story as many women workers have secured jobs by going directly to the gates of the plants operating on defense contracts. In general, women are doing efficient work in various types of defense production. Women are proficient at inspecting cartridges and polishing small parts for rifles, and in one plant they are reported as assembling, shaping, sharpening, testing and chrome plating bandage shears for government use. Women work in rubber factories on the bullet-proof gas tanks - rubber lined and covered. They work also on silk parachutes.

3. While as yet few women are employed in airplane assembly factories - though they are being used to a considerable extent in making the parts and accessories for planes, Women's Bureau investigations show that the force of women could be considerably increased. Operations which women could perform with a little training include riveting, drilling, counter-sinking, dimpling, and bucking; much of the bench work on the simpler subassemblies; and at least one-fourth of the inspection of parts.

4. There is a greatly increasing demand for many other types of workers by the United States Government. A recent press statement estimates that a million new employees will be placed on the Federal pay-roll in the two-year period ending July 1, 1942. Only about two-thirds of this number will constitute new jobs, the rest will be accounted for by turnover. While no breakdown of this number has been made by sex, it is obvious that a large percentage of Federal jobs will go to women. Thousands of women are finding employment in Government arsenals. Clerical workers are in great demand. Furthermore, because of the increasing difficulty of obtaining adequate persons to fill many positions essential to the defense program the Civil Service Commission in June appealed to all Federal agencies to employ more women and in a greater variety of positions.

5. There are general indications that many women are leaving household employment for jobs in defense and various service industries.

FORCES AND EVENTS THAT ARE BETTERING CONDITIONS OF WOMEN'S WORK

During the past year conditions under which women are at work have been improved. Some of the most outstanding gains made are these:

In the field of Federal control or aid:

1. In October of 1940 the work week prescribed by the Fair Labor Standards Act was lowered from 42 to 40 hours. Furthermore, many thousands of women have had their wages raised above the minimum specified in the flat rate of the Fair Labor Standards Act. These are in paper, leather, luggage and leather goods, railroads, enameled utensils, carpets and rugs, embroideries, converted paper products, portable lamps and shades, drugs, medicines, and toilet articles, and rubber. In addition, June 30 marked wage raises for the largest number of workers ever to have increases by an industrial wage order, 300,000 in textile mills (other than wool and knit), two-thirds of them in cotton mills. The new rate of 37½ cents takes the place of a 32½-cent minimum set in the original order of 1939. Lowest-scale workers who previously received $13 now earn $15, in each case for the standard 40-hour week. During the year minimum rates were set for many industries in Puerto Rico, which, while low in relation to mainland standards, constitute significant wage increases for many hundreds of women.

2. The most significant minimum rates set for workers employed on government contracts of $10,000 or over during the year were those covering the uniform and clothing industry, including suits and coats, outdoor jackets, and wool trousers. Also covered by a special rate were die castings.

3. Women union members gained new job security through a Supreme Court decision that the National Labor Relations Board has

constitutional power to require an employer to hire a worker once denied employment because of union connection.

4. The increasing effectiveness of the Social Security Program in benefiting women workers as well as men is shown by the fact that during 1940 $520,000,000 was paid out in unemployment insurance benefits to unemployed workers and about 3,800,000 placements were made by employment offices. Already 45,000,000 persons have earned wage credits in the old-age and survivors insurance plan; at the end of 1938 about 11,750,000 women - 29 percent of all applications for account numbers under this plan, were registered.

5. Studies have been made in certain fields which may point the way to the betterment of employment conditions for women. Some of the more important surveys made by the Women's Bureau include the following:

   a. Defense activities - determining woman-labor needs in a variety of defense industries, including small arms and artillery ammunition and aircraft.

   b. Migratory labor in Delaware canneries.

   c. Maryland service industries.

   d. Employment conditions and demand for workers in offices.

   e. Rural home workers - bedspreads, etc., and channels for their sale.

   f. Manufacture of confectionary, chewing gum, etc.

   g. California cost of living for women workers.

   h. Earnings and hours in stores and restaurants in Michigan.

In addition to the field surveys mentioned, important studies were made of special defense problems of women, including the hazards involved in the lifting of heavy weights and desirable work-clothing for women in defense industries.

Toward the close of this period the Women's Bureau sent a staff member to Argentina to study industrial and social conditions as a basis for a regular interchange of technical information, experience, and ideas concerning women workers between groups with kindred interests in Argentina and the United States.

<u>By the action of State authorities:</u>

1. New minimum-wage orders in a number of industries and States have raised the wages of many women. (See apendix for details).

2. Some advances have been made in State legislation. (See apendix for details.) Though 43 State legislatures met in regular session there were few major changes in basic wage and hour legislation

ARE STATE LABOR LAWS FOR WOMEN BEING RELAXED?

Experience during the war of 1914-1918

The Woman in Industry Service, the forerunner of the Women's Bureau, was created in 1918 to safeguard the welfare of the thousands of women called upon to take their places in war industries. In that year only 12 States had a minimum-wage law for women; only 3 States and the District of Columbia had legal maximum hours for women of 8 a day and 48 a week. There was no such Federal legislation as the Fair Labor Standards Act, the Public Contracts, Act, the National Labor Relations Act, and the Social Security Act. However, the entrance of the United States into the war in 1917 saw a movement to relax such labor standards as were in effect. The Council of National Defense urged that governors be vested with authority to suspend or modify legal restrictions at the recommendation of the council. Vermont, New Hampshire, and Connecticut passed laws giving the Governor power to suspend labor regulations. A Massachusetts law placed such suspension in the hands of a board including representatives of both employers and workers, with the State commissioner of labor as chairman. The New York legislature passed a similar bill but it was vetoed by the Governor.

At the close of the war some of the emergency acts ceased to operate; others continued in effect and will be operative if the United States again goes to war. These latter acts include the following:

Connecticut - The Governor may suspend the State night-work law in the event of war or other serious emergency.

New Hampshire - The State hour law for women does not apply in the manufacture of munitions or supplies for the United States Government, or for the state "while the United States is at war with any other nation."

Vermont - The Act of 1917 passed by the Legislature apparently is still in effect. This provides that "the commissioner of industries may, with the approval of the Governor, suspend the operation of the laws relating to the hours of employment of women and children while the United States is at war".

Current indications as to the relaxing of labor laws for women.

The past year has witnessed several specific instances of the relaxing of labor laws affecting women. Some of these can be traced without question to the defense program and others may be presumed to have been so affected.

In Connecticut the 9-48 hour law for women in manufacturing was amended by authorizing the Governor, in the interests of national defense, to allow 10 hours daily, 55 hours weekly, during an emergency.

In Nebraska hour-law amendments exempt public service from the State hour-law. The night-work law was amended to prohibit employment between 1 and 6 a.m. instead of 12:30 and 6 a.m. It provides further that the Commissioner of labor may permit employment between 1 and 6 a.m. in all covered industries except offices.

Ohio amended its hour law to allow more than 8 hours a day but not over 6 days a week for women in financial institutions during any period of the year requiring preparation of government reports. Only women preparing these reports are covered. A further amendment extends to all communications' companies the exceptions formerly applying to telephone companies, adds pharmacy to the professions exempted, and defines a "day" as the period from midnight to midnight.

Another evidence of "the attempts of opponents of progressive legislation to exploit the national emergency to reactionary ends, was the effort made in State capitols to reduce financial appropriations for labor law administration. Considerations of economy in non-defense expenditures, with emphasis upon the production of military equipment, have also provided the background for the defeat of progressive wage and hour bills and 'Little Wagner Acts'". 1/

ADVANCES IN WOMEN'S WAGES

In addition to the Federal and State legislation referred to, widespread wage increases for women of from 5 to 10 percent may be noted in many industries, particularly in mass-production industries where new union agreements have been negotiated. For example,

1. Wage increases were secuced in at least 45 rubber plants in 1940 in amounts ranging from 1 to 25 cents an hour.

2. A contract covering some 6,000 workers in 3 States has been signed with a shirt manufacturer. Eventually it may raise earnings for some 100,000 employees. Probably about four-fifths of all in the industry are women.

3. Eight thousand cannery workers in a single large plant, have received a 7½ percent wage increase which will amount to $500,000 a year. A large proportion of the workers in this industry are women.

4. Some 16,500 workers in the viscose industry recently received pay increases amounting to 5 cents an hour for men and 3 cents for women.

5. Twenty thousand workers for a New York shoe firm received pay increases amounting to 6½ percent.

6. Other woman-employing industries where wage increases have been noted within recent months include packing, steel, automobiles, electrical, aluminum, and various branches of the textile industry.

1/ The American Labor Legislation Review, June 1941. p. 88.

7. Wage raises for women to the base rate of 72½ cents per hour set for men in one of the largest steel companies in the country was announced this spring. Similar cases of starting wages for women equal to those for men in other industries have been reported during the past year.

8. In connection with defense production the Women's Bureau has found beginning rates for most women run generally from 40 to 45 or even 50 cents an hour. Rates are raised with experience.

SUMMARY AND FUTURE NEEDS

The two problems discussed last year as looming large are even more significantly those facing us during the coming year. These are:

FIRST: The months that lie ahead will increasingly throw into relief the role of the woman worker in defense industries. Every effort must be made to train her for her work, place her in occupations for which she is well qualified by reason of her natural endowments, and safeguard her health and wellbeing. Those of us who have had years of intimate contact with these problems must be prepared to take an active part in formulating standards and policies.

SECOND: There must be no slackening in the struggle to secure for women workers everywhere the benefits of reasonable labor regulation. There are still large groups of workers who are without the benefits of State laws or not covered by Federal law. Two groups in particular are agricultural workers and household employees.

Furthermore, there must be increasing attention to living conditions for women workers. Many defense plants are being erected in small communities without adequate facilities for the housing and recreation of the thousands of women employees, a large number of whom are living away from home for the first time and for whom these problems loom large.

Even during the present emergency, because of the occupational and geographical migrations which it necessitated, there is a definite need to facilitate readjustments of women workers to prevent hardship for them when the emergency program ends.

A further problem relates to the effect of defense priorities in production whereby curtailment of output of goods to meet normal consumer needs may mean job dislocations for many women. In such cases special effort must be made to re-absorb such workers.

The recent executive order of the President requesting that there be no discrimination against the employment of Negroes in defense industries calls attention to another basic problem which deserves careful consideration in regard to Negro women at a time when the curtailment of the W.P.A. program has thrown on the labor market additional numbers of these workers.

It must be kept in mind that the country's inner defenses - defenses against exploitation, poverty, disease - are as important to the National existence as the military preparations being made. No stronger weapon against aggression can be forged than the day-by-day demonstration that the American way of living is the best designed to meet the needs of mankind.

SUMMARY OF IMPORTANT LAWS AND MAJOR EVENTS IMPROVING WOMEN'S STATUS
(Supplement to Report of Women in Industry Committee)

September 1940 to August 1941

CONTENTS

I. Court Action
II. Attorney General's Opinions
III. Legislation in the States
IV. List of Minimum-Wage Orders

I. COURT ACTION
(Limited to statutes applying particularly to women workers)

California

The fact that a minimum-wage order set up a standard without defining it as such does not destroy the validity of the order. (This case was brought by an association of laundry owners seeking a declaration by the Superior Court of Los Angeles County as to the term "standard week" used in a number of minimum-wage orders. The Court upheld the contention of the Division of Industrial Welfare that the standard week for which the $16 minimum must be paid is the usual number of hours an establishment may operate, even if less than 48.) --- Los Angeles County Superior Ct., Troy Laundry v. Clark et al., March 21, 1941.

An order prescribing a blanket minimum wage for all unclassified industries is invalid as authorized by statute for want of due process. (The court held that inadequacy of wages could not be determined at the same time for occupations so diverse as boot blacking and taxi driving, both admittedly covered by the order for "unclassified occupations".) Superior Ct. App. Dept. Los Angeles, People v. Johnson, Jan. 30, 1941.

The section of the California hotel and restaurant minimum wage under stating that no employer may include tips received by employees as part of the legal wage was declared void by a California Court. This section was held in conflict with the Tipping Sign law enacted by the Legislature, which provides that employers may consider tips as part of the legal wage of workers if signs informing the public of this situation are conspicuously placed at the location where the enterprise is carried on. Los Angeles Superior Court, California Drive-In Association, Margarete L. Clark, April 14, 1941.

District of Columbia

Receipts for wages do not represent the actual payment of wages where they are used as a device to circumvent the minimum-wage law. Municipal Ct. Groves v. Adelman, Feb. 28, 1941.

Georgia

Criminal proceedings against violation of a municipal ordinance prescribing hours for beauty operators are not subject to equitable relief, Sup. Ct. Atlanta, Anthony v. Atlanta et al., Sept. 26, 1940.

Illinois

A person who employs three beauty culturists in a beauty shop is engaged in such a business as to be subject to the provisions of the minimum-wage law and must therefore keep a record of the hours worked and the wages paid to such employees. Appellate Ct., First District, People v. Maggi (Ill. 1941), April 23, 1941.

Michigan

The Michigan State Supreme Court held constitutional a Michigan law making it a misdemeanor for an employer of both men and women in the manufacture of any article to pay any woman a lower wage "than is being paid to males similarly employed". General Motors Corporation v. Read, September 6, 1940.

New York

The New York directory order providing for minimum wages in the confectionery industry is unreasonable to the extent that it requires paying the minimum regardless of the gainful hours or desisting from activities not affording full-time work. N. Y. Sup. Ct., Mary Lincoln Candies v. Dept. of Labor, Nov. 26, 1940.

On an appeal to review the validity, reasonableness, legality, and constitutionality of the order governing minimum wages in the cleaning and dyeing industry, the Board of Standards and Appeals ruled that the members of the Wage Board were validly appointed; that the basic hourly rates for Zones A, B, & C, and the overtime rate for work in excess of forty hours, are valid and reasonable; that the regulation of the split shift is valid and reasonable except the requirement of a written permit and the ruling defining a "reasonable lunch period;" and that all other challenged provisions are valid and reasonable. N. Y. Board of Standards and Appeals. Ames Stores, Inc., et al., (1940) Case No. 1448-39, August 28, 1940.

The revision of an industrial home-work order to include male persons is within the powers of the legislature and such act does not affect the validity of the order. Sup. Ct., First American Natural Ferns Co. v. Picard et al., Nov. 5, 1940.

The New York minimum-wage law has been the subject of considerable court action during the year. On February 11 the Court of Special Sessions in Bronx County (People v. Bess Morgan) held the law unconstitutional in its provision that an employer can be prosecuted criminally for failure to pay the minimum wage under a mandatory order. It upheld the part of the law requiring accurate records to be kept, and held the employer guilty on that count.

However, on February 13, the Manhattan Special Sessions Court, in the case of Louis Ponte, which was identical with that of Bess Morgan, rules that the law was constitutional, and that the employer was guilty of paying rates below those fixed in the mandatory order.

Since the unfavorable decision of February 11, in more than 40 similar cases the courts have upheld the constitutionality of the law.

Pennsylvania

A most significant recent court case is the decision of a Pennsylvania Court declaring that the State minimum wage law is constitutional and does not violate the provisions of the State and Federal Constitutions. The case was brought by a laundry owner in connection with the mandatory minimum-wage order covering laundries. Court of Common Pleas of Dauphin County, W. J. Fisher v. Commonwealth, July 5, 1941.

II. ATTORNEY GENERALS' OPINIONS
(Limited to opinions concerning matters of particular application to women workers)

California

The setting up of a voluntary audit system in the minimum-wage orders issued by the Industrial Welfare Commission is within the order-making power of the Commission. Attorney General Opinion, March 20, 1941.

After the Industrial Welfare Commission has determined that it may desire to rescind, alter, or amend, a prior order, a public hearing must be held and the same notice must be given as prescribed for the original hearing. Attorney General Opinion, Dec. 21, 1940.

The day-of-rest statute, which provides that each employee is entitled to one day's rest in seven and that no employer shall cause his employees to work more than 6 in every 7 days, is mandatory. It prohibits the employment of any person for more than 6 out of 7 days and the employee may not agree to work on the seventh day. Attorney General Opinion, Dec. 21, 1940.

An Industrial Welfare Commission regulation prohibiting women or girls from lifting burdens in excess of 25 pounds takes precedence over the section in the Labor Code imposing a 50-pound limitation. Attorney General Opinion, August 21, 1940.

The Industrial Welfare Commission has the authority to fix minimum wages for women and minors engaged in industrial home-work. Attorney General Opinion, September 20, 1940.

Idaho

The Women's 9-hour-day law (Sec. 43-707) is not operative so far as the employment of women by railroads in the course of the interstate commerce is concerned. Attorney General Opinion, March 22, 1941.

Indiana

The night-work law for women does not apply to female telephone switchboard operators employed in the office of a manufacturing plant. Attorney General Opinion, January 7, 1941.

Kentucky

A charitable institution devoted to missionary work among mountain people is subject to the State wage and hour law. Attorney General Opinion, April 21, 1941.

The one-day-of-rest law does not apply to charitable institutions. Attorney General Opinion, April 21, 1941.

Rural electrification cooperative corporations are subject to the wage and hour laws governing women and minors. Attorney General Opinion, January 20, 1941.

Louisiana

The provisions of the maximum hour law do not apply to beauty schools and beauty shops unless there is a sale of merchandise in connection with the operation of such beauty schools or shops entirely independent of such as might be used in the work conducted in the establishments. Attorney General Opinion, February 19, 1941.

The State of Louisiana has no legislation fixing minimum wages for sales girls employed by chain stores in municipalities with population under 10,000. Attorney General Opinion, February 18, 1941.

An employee working in a branch office of a laundry where no washing, cleaning, ironing, etc., is done, does not come within the provisions of Act 363, Acts of 1938, since such branch office is neither a "laundry" nor a "mercantile establishment". Attorney General Opinion, March 1, 1941.

Missouri

Employers desiring to reduce the wages of any of their employees must give such employees 30 days' notice of such reduction. Attorney General Opinion, January 21, 1941.

Nebraska

A charwoman or janitress in an office building is not a female employed in an office within the meaning of Section 48-205. Attorney General Opinion, April 7, 1941.

Complaints concerning violations of the women's 9-hour law may be filed with any county attorney by employees as well as by Department of Labor Inspectors. Attorney General Opinion, September 3, 1940.

Pennsylvania

Where interstate carriers and their employees enter into collective bargaining agreements under the federal Railway Labor Act, the Pennsylvania Women's Labor law is superseded. Women employees of railroads engaged in interstate commerce are no longer subject to the provisions of the Pennsylvania Act. Attorney General Opinion, March 4, 1941.

Texas

A tavern engaged mainly in the sale of beer, and which is located along a public road, comes within the scope of Art. 1569 of the women's labor law. Attorney General Opinion, March 10, 1941.

Washington

Institutional maids, that is, maids in county institutions, are excluded from the benefits of the minimum-wage law only when their employment is concerned primarily with general housework. An institutional laborer, that is, a man of all work, does not come within the exception. Letter of Attorney General, April 30, 1941.

Wyoming

The women's eight-hour law does not cover persons employed as canvassers, especially where the employer does not exercise any supervision or control over the hours of employment. Attorney General Opinion, March 6, 1941.

III. LEGISLATION IN THE STATES

WORKWEEK

Connecticut - The 9-48 hour law has been amended by authorizing the Governor, in the interest of national defense, to permit 10 hours a day, 55 a week, for more than the 8 weeks already permitted in cases of emergency.

Maine - The hour law has been amended to exempt women employed in executive administrative, professional, or supervising positions and their personal office assistants who receive at least $1200 a year.

Nebraska - The amendment to the 9-54 hour law exempts public service. Also provides that 11 hours a day, for emergency periods of 20 days at a time, may be permitted by Commissioner after careful examination, in plants processing agricultural products. A fee of $3 is to be charged for any permit and credited to the "labor fund" out of which expenses for administration of the act are to be paid.

New York - An 8-hour day, 40-hour 6-day week, has been fixed for women bindery workers over 21. A week of 48 hours may be allowed if overtime is paid.

Ohio - The 8-48, 6-day week has been amended to allow more than 8 hours a day but not over 6 days a week for women in financial institutions during any period of the year requiring preparation of government reports. This provision applies only to women working on such reports.

Further amendment extends to all communications companies the exceptions now applying to telephone companies; adds pharmacy to the professions exempted; defines a "day" as the period from midnight to midnight; requires 10 hours rest between workdays; clarifies the exemption for canneries, making it apply only to women over 21.

MINIMUM WAGE

Rhode Island - The minimum-wage law has been amended to clarify enforcement provisions. The employer or his agent is now made directly responsible for compliance.

Puerto Rico - A law has been approved providing machinery for establishing minimum-wage rates, maximum hours, and proper working conditions for all employees in any occupation, business, or industry, except domestic service. This act does not repeal the old minimum-wage and maximum-hour laws for women.

TIPS

Colorado passed a law providing that any employer engaged in any business where the custom of patrons giving tips or gratuities to employees prevails, may not assert any right to such tips or consider the same as part of the employees' wages unless a printed card at least 12 inches by 15 inches in size containing thereon a notice to the public that all tips given to the employees are not the property of the employee but belong to the employer is posted in his place of business, in a conspicuous place.

NIGHT WORK

Massachusetts - Suspension of the 6 o'clock law for women in textiles has been extended for 2 years. This permits employment until 10 p.m. as in other manufacturing.

Nebraska - Hour law amended to permit employment of women until 1 a.m. instead of 12:30. Commissioner of Labor may permit employment between 1 and 6 a.m. in all covered industries except offices (i.e., in manufacturing, mechanical, or mercantile establishments, laundries, hotels, or restaurants.)

SEX OR MARITAL STATUS

New Jersey - Passed a law providing against discrimination based on sex or marital status in appointment to all offices or boards and commissions and employment in other public service in the State and its subdivisions.

REGULATION OF HOME WORK

Massachusetts - Bill passed House.

New Jersey - Bill reported favorably in Senate.

HOUSEHOLD WORKERS

Michigan - 60-hour workweek bill passed House, failed in Senate.

California - Several hour bills introduced. All failed.

New York - Bills introduced relating to hours, minimum wages, workmen's compensation. All failed.

Massachusetts - Bill introduced to attain minimum wage. Referred to Committee.

IV. LIST OF MINIMUM-WAGE ORDERS.

MADE MANDATORY WITHIN YEAR

Massachusetts - Office and Other Building Cleaning. Dec. 1, 1940.
Jewelry. Dec. 1, 1940.

New Hampshire - Retail. Jan. 6, 1941.

Ohio - Beauty Culture. April 4, 1941

Pennsylvania - Laundry. Feb. 1, 1941

NEW ORDERS

Connecticut - Cleaning and Dyeing. Oct. 7, 1940. (Replaces 1939 order.)
Beauty shops (males and females). March 3, 1941.

Massachusetts - Office Workers. April 1, 1941.

New York - Hotels. Nov. 25, 1940.

Ohio - Beauty Culture. Dec. 5, 1940. Became mandatory within year. See above.)

Utah - Laundry - June 16, 1941
Public Housekeeping. July 14, 1941.

REVISED

California - Public hearings have been held in San Francisco and Los Angeles on revision of the series of Wage orders long in effect. Orders in this State cover maximum hours andother labor standards as well as wages.

Illinois - Beauty shops. March 24, 1941.

Oregon - Eight orders revised - by increasing minimum from 30 to 35 cents an hour, in all occupations except laundry work, where increase is from 30 to 33 cents an hour. July 22, 1941. Rates for the canning industry have been revised twice. April 1 and June 8, 1941.

Washington - Beauty culture. Dec. 1, 1940.

WOMEN IN INDUSTRY

A report to the Annual Meeting of the

INTERNATIONAL ASSOCIATION OF GOVERNMENTAL LABOR OFFICIALS

September 9-12, 1940

New York, N. Y.

WOMEN IN INDUSTRY

September 1939 to September 1940

INTRODUCTION

The most important development in the past year was the launching of the preparedness program, in which women must play such an important part. Designed to assure and to speed up production in certain fields, this program as it relates to women involves the training and the adequate protection of women operatives called to work in defense industries. Though the undertaking is only a few months old, much has been done along these lines. High spots include:

1. the setting up of an Advisory Committee to the Women's Bureau of representatives of international unions that have active women members who are in the key defense industries, to recommend how women can best function in the emergency.

2. two meetings of this Committee with members of the Women's Bureau in Washington.

3. making available material on the experiences during the World War of 1914-18 in securing increased output without sacrificing the efficiency and health of women workers.

4. a report on the general types of work in the program of expanded production for which women are best fitted, on the need for special training, and on employment standards conducive to their welfare and most efficient production.

It is estimated conservatively that not far from 2 million women are immediately available to fit into defense work. Probably at least half a million more are now in part-time employment and an additional large but undetermined number can fill jobs more skilled than those they are now engaged in.

FORCES AND EVENTS THAT ARE BETTERING CONDITIONS OF WOMEN'S WORK

In addition to the emphasis on national defense, conditions under which women are at work have been improved. Some of the most outstanding gains made are these:

<u>In the field of Federal control or aid</u>:

1. An estimated 4 million women are covered by the Fair Labor Standards Act, which prescribes with certain exceptions 30 cents an hour for a 42-hour workweek, with time and a half for overtime. Women's Bureau information on wage trends in the more important

woman-employing industries shows definite gains in women's hourly earnings. Many women have had their wages raised further by the higher minimums set for the hosiery, textile, millinery, shoe, knitted underwear and commercial knitting, woolen, hat, knitted outerwear, apparel, and pulp and primary paper industries.

2. From July 1, 1939 to June 30, 1940, approximately 31,000 men and women workers were reinstated by the National Labor Relations Board after strikes and lockouts and some 4,000 after discriminatory discharges. About 2,500 workers received back pay amounting to around $400,000.

3. Minimum wage rates have been set for workers employed on Government contracts of $10,000 or over in the paper and pulp, small arms ammunition, explosives, and related products, fertilizer and cement industries. These rates undoubtedly have raised the wages of many women workers in all but the last two mentioned industries, in which no women are employed.

4. Intensive studies have been made in certain fields which may point the way to the betterment of employment conditions for women. Some of the more important surveys made by the Women's Bureau include the following:

    1. A survey of Fruit and Vegetable Canning (To determine the effects of State minimum-wage regulations, and unemployment compensation, Public Contracts Act and the Federal Fair Labor Standards Act, not in effect when the 1938 survey was made.)

    2. Fish Canning

    3. Women's Employment and Personal and Family Responsibility, in Cleveland and Salt Lake City.

    4. Office Workers' Study.

    5. Booth Renting in Colored Beauty Shops in the District of Columbia.

    6. Maine Service Industries

    7. Studies of injuries to women, both accidents and occupational diseases, have been continued.

5. From September 1, 1939 to June 30, 1940, almost half a billion dollars was paid to men and women workers as unemployment compensation under the provisions of the State unemployment insurance laws, established in accordance with the Social Security Act.

6. Over 14 million women have had Social Security accounts established for them in which will be recorded their earnings that entitle them and members of their families to benefits under the old-age and survivors insurance system of this act.

By the action of State authorities:

1. New minimum-wage orders in a number of industries and States have raised the wages of many women.

2. Some advances have been made in State legislation.

Little legislative activity is noted this year. This is explained in part by the fact that few of the legislatures were in regular session.

ADVANCES IN WOMEN'S WAGES

In March 1940 women's hourly earnings in the major woman-employing manufacturing industries had increased 3 percent from March 1939 figures for the same firms, according to data reported twice a year by the Women's Bureau. Hourly earnings had increased in the great majority of the industries reported. These averages were above 35 cents in all the reported industries.

During the year the 30-cent minimum required under the Fair Labor Standards Act went into effect, and the resulting increases at the bottom of the wage scale had an important influence in pushing up the hourly averages. Most notable of the advances were the following:

10 percent - cotton dresses
6 percent - cotton goods; hosiery; confectionery; women's undergarments; rubber boots and shoes.
5 percent - silk and rayon; woolen and worsted.

Average weekly earnings in these firms were not greatly different from those of a year ago, due to some extent to a decline of nearly 3 percent in hours worked. There were, however, decided changes in earnings in a number of industries. In March 1940 week's earnings of women in these manufacturing industries averaged $15.92, with an average of 34 hours worked in the week. Here again the wage picture varies widely with the industries, some having high, others, quite low averages.

STATE LABOR LEGISLATION AND LEGAL DECISIONS

Appended to this report is a supplement giving certain details concerning State labor legislation and legal decisions. With only three legislatures in regular session in the second half of 1939 and nine in 1940, there was little opportunity for significant legislation. More activity is noted on the part of the various State wage boards, with four orders made mandatory and nine

new orders issued.

Bills to limit hours of work and to extend the minimum-wage law to household workers were introduced but not passed in the State of New York. Four States considered, but failed to enact, wage and hour bills covering men and women workers alike.

The effort to curtail the employment of married women in public service has abated somewhat. Mississippi considered but failed to pass such a measure. Louisiana passed but later repealed a law of this type. On the other hand, though a bill to safeguard the rights of married women was introduced in the New Jersey legislature it failed of enactment. It is hoped that the New Jersey example of attempting to enact a statutory defense against this insidious type of class legislation will be followed by other State legislatures and with more success.

WOMEN WORKERS' NEEDS CONSIDERED AT INTERNATIONAL CONFERENCE

The Second Conference of the American States Members of the International Labor Organization, held in Habana, Cuba, November 21 to December 2, 1939, adopted resolutions stressing, among other things, the need to evaluate women's skill on the same basis as men's and to develop means, such as vocational training, to improve women's output where it falls below men's in quantity or quality. The Conference recommended the abolition of industrial home work, and outlined strict regulations to control it as long as it exists and requiring the same minimum-wage rates as for similar work in factories.

Other resolutions called for a progressive program comprising application of social legislation to domestic and agricultural workers, legislation to prohibit the dismissal of married women workers because of their marital status, the granting to women of all the rights necessary to enable them to function fully as responsible citizens, including the right to organize for collective bargaining, to have full representation in all bodies responsible for preparing and administering social and labor legislation, as well as the right to vote and hold office.

SUMMARY AND FUTURE NEEDS

In looking ahead two problems loom large:

FIRST: The months that lie ahead will increasingly throw into relief the role of the woman worker in defense industries. Every effort must be made to train her for her work, place her in occupations for which she is well qualified by reason of her natural endowments, and safeguard her health and wellbeing. Those of us who have had years of intimate contact with these problems must be prepared to take an active part in formulating standards and policies.

SECOND: and of equal importance, there must be no slackening in our struggle to secure for women workers everywhere the benefits of reasonable labor regulation. There are still large groups of workers who are without the benefits of State laws or not covered by Federal law. Two groups in particular are agricultural workers and household employees.

It must be kept in mind that our inner defenses - defenses against exploitation, poverty, disease, - are as important to our national existence as the military preparations we are making. No stronger weapon against aggression can be forged than the day-by-day demonstration that the American way of living is the best designed to meet the needs of mankind.

SUPPLEMENT TO REPORT OF WOMEN IN INDUSTRY COMMITTEE

SUMMARY OF LAWS AND MAJOR EVENTS IMPROVING WORKING WOMEN'S STATUS

September 1939 to September 1940

CONTENTS

Court Action
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COURT ACTION
(limited to statutes applying particularly to women workers)

Connecticut

Connecticut statute prohibiting night work held constitutionally applicable to women entertainers in restaurants, notwithstanding their professional status. Conn., Sup. Ct., Doncourt v. Danaher, June 13, 1940.

Massachusetts

Woman in charge of store of cleaning and dyeing corporation held to be employee of corporation, notwithstanding execution of lease of store and designation of woman as lessee. Mass., Sup. Ct., Commonwealth v. Weinfield's, Inc. Jan. 30, 1940.

New Jersey

Interpretation of R. S. 34'2-24 so-called Women's 10-hour law. Toohey v. Abromowitz Dept. Store, Inc. New Jersey Sup. Ct. Feb. 23, 1940.

Washington

Order fixing minimum wages of operators in beauty parlors or similar establishments held inapplicable to instructors in school for beauty operators. Wash. Sup. Ct., McDonald v. Goddard, Feb. 6, 1940.

ATTORNEY GENERALS' OPINIONS
(Limited to opinions concerning matters of particular application to women workers)

Connecticut

A manicurist employed in a barber shop will not generally be considered as within the provisions of minimum wage Directory Order No. 5 for beauty shops. Attorney General's Opinion, Sept. 13, 1939.

Delaware

Beauty shops come under the law fixing hour limitations for females in any "mercantile, mechanical or manufacturing establishments." Letter of Attorney General, May 14, 1940.

Kentucky

Apprentices who work in beauty parlors are entitled to 18 cents an hour for 2,000 hours under apprentice certificates, at the end of which period the certificates are canceled, such persons then being entitled to 22½ cents an hour. Letter of Asst. Atty. Genl., April 9, 1940.

LEGISLATION IN THE STATES

WORKWEEK

Kentucky--An act relating to employer-employee relationships and including a provision for a 6-day week for all employees (with certain exemptions, including all persons working not over 40 hours a week) unless time and a half is paid on the seventh day.

COVERAGE

New York--A law exempting from the 10 p.m. - 7 a.m. night-work law women employed by florists at Easter and Christmas.

REGULATION OF HOME WORK

New York--A law requiring an employer to attach to materials for home manufacture a label with his name and address legibly written or printed in English.

WAGE AND HOUR BILLS

Introduced into the following States, but none passed:
Louisiana, New Jersey, New York, South Carolina.

HOUSEHOLD WORKER BILLS

New York--Introduced, but not passed, bills to extend the minimum-wage law to household employees and to limit their workweek to 60 hours.

LIST OF MINIMUM-WAGE ORDERS

Made Mandatory within the year:
Massachusetts--Beauty culture, June 1, 1940.
New Jersey--Light manufacturing, July 15, 1940.
Wearing apparel and allied occupations, July 15, 1940.
Cleaning and dyeing, May 6, 1940.

New orders:
Colorado--Beauty service, Dec. 4, 1939.
Public-housekeeping, June 16, 1940.
Connecticut--Laundry, June 3, 1940.

New orders (continued):
Maine--Packing fish and fish products in oil, mustard, and tomato sauce, April 11, 1940.
New Hampshire--Dry cleaning, May 20, 1940.
New York--Restaurant, June 3, 1940.
Pennsylvania--Laundry, June 1, 1940.
Utah--Retail, June 3, 1940.
Restaurant, August 5, 1940

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Work and Wage Experience of Willow Run Workers[1]

THE work of the thousands of men and women hired to produce B–24 Liberators at the Willow Run bomber plant ended in July 1945.[2] Some of the workers continued to live in the neighborhood of the plant, but many more returned to their home communities or other communities, where they are seeking or have already obtained employment. A small number of workers, mainly women, withdrew from the labor market. For most of Willow Run's workers, however, continued gainful employment is an economic necessity.

At the Willow Run plant new jobs, new skills, and new levels of earnings were acquired. For some of the workers the change from their prewar status was very great as regards both their earnings and the way they made their living. Farmers became riveters and housewives and clerks became assemblers and drill-press operators. For a variety of reasons the majority of the workers were looking forward to factory employment as the most desirable method of earning a living after the war. What they did and what they earned at their war work will undoubtedly influence the kind of peacetime employment they will seek.

This study by the Bureau of Labor Statistics is one of a series designed to provide factual information useful in the solution of some of the industrial problems emerging from reconversion to peacetime production. This report describes the industrial and educational background of the workers at the Willow Run bomber plant, their family status, wartime migrations, earnings, and postwar expectations. The study is based on a group of 307 persons who were selected as representative of the 7,400 production workers still employed at the plant at the end of May 1945. On the basis of follow-up studies of these same 307 individuals, the Bureau will report periodically on the experience of these workers—their employment, occupations, and earnings—after the shut-down of the plant.

Physical Characteristics of Willow Run

THE BOMBER PLANT

The Willow Run bomber plant, the world's largest factory and one of America's most-publicized plants, is on the outskirts of Ypsilanti, some 30 miles west of Detroit. The plant is reported to have cost $100,000,000, and its nearly 3½ million square feet of space cover 80 acres. Among other materials, 5,000,000 bricks, 5 miles of water pipes, and 100,000 fluorescent lights are reported to have been used in its construction. The plant is said to have a capacity for employing 100,000 workers; the actual peak employment (reached in July 1943) was somewhat over 42,000 workers.

[1] Prepared by Joseph F. Bober and Carrie Glasser of the Bureau's Wage Analysis Branch.

[2] As of July 30 there were 3,167 workers at the plant, mainly maintenance and protection workers. By September 1, it was estimated, only a small force of 800 would be employed for fire and plant protection and general maintenance.

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The plant was built by the Government as a special factory, equipped with special tools for a special war purpose, namely, to turn out B–24 Liberator bombers. Exactly 8,685 of these planes came off the assembly lines between January 1942 and June 1945. At the peak of production the ships were produced at the rate of 1 every 55 minutes. An Army-Navy "E" award was made early in May 1945. Willow Run's record has been recognized as one of the great achievements of American production.

By July 30, 1945, the plant had ceased to be an operating unit and for many months it appeared that the shut-down was permanent. On September 21, 1945, however, Henry J. Kaiser, the West Coast shipbuilder, announced the formation of a new automobile company to produce low- and medium-priced cars. Two weeks later the new management reported that part of the plant would be taken over officially on October 15 and that production was expected to start in March 1946.

WILLOW RUN HOUSING PROJECT

To ease the housing shortage created by the operation of the bomber plant, the United States Government, through the Federal Public Housing Authority, is said to have spent $23,000,000 erecting Willow Run project on some 2,000 acres of land purchased through condemnation. This housing project is partly in Ypsilanti Township and partly in Superior Township, a little less than 2 miles northwest of the bomber plant. The project included dormitories for 5,000 single persons, 2,500 temporary family-dwelling units, 1,000 war apartments and 960 duplex trailer apartments for 2-person families, and trailer space for 500 private trailers. Although the project was planned to accommodate about 20,000 people, the maximum actually housed was approximately 14,000.

At its peak, Willow Run project had a large department store, two chain drug stores, two chain supermarkets, two beauty shops, a barber shop, a shoe-repair shop, a watch-repair shop, two cleaning establishments, two laundries, two cafeterias, two movie theaters, a bowling alley, three grade schools within the project and access to a fourth school just outside, three physicians, two dentists, a Catholic Church (other denominations did not erect their own building but used other available meeting facilities), a three-engine fire department, a public works department to care for the water and sewage systems, build and repair roads, collect and dispose of garbage and trash, seed lawns, etc., and an extensive recreational program with supervisors for children.

With the closing of the bomber plant, however, Willow Run project was on its way to becoming a modern "ghost" town. By late fall, 1945, the population of the project had dwindled to only 950 persons, most of them living in the family units. Half of this remaining population was Negro. Some of the buildings, especially family dwelling units and dormitory units, were dismantled and moved to other housing projects in Detroit and Ecorse, Mich. Other housing units no longer needed in the project are to be dismantled and moved to housing projects still in need of additional units. It was expected, unless the reopening of the plant under Kaiser management caused a change in plans, that the housing project would soon be closed down completely.

The "Bomber Local" at Willow Run

The United Automobile Workers Union (CIO) has closed-shop contracts with the Ford Motor Co. When the bomber plant started operations, late in 1941, the first workers were transferees from Ford's River Rouge Plant in Dearborn and Ford's Generator Plant in Ypsilanti. These workers remained members of Locals 600 and 849 until March 18, 1942, when the UAW issued a charter organizing the workers into Local 50, popularly known as the "Bomber Local."

Until employment increased to a point representative of the plant in full operation, the workers had their own bargaining and district committeemen but no officers; the local was administered by a regional director. Local autonomy was granted on May 30, 1943, the bylaws were adopted in June, and elections were held on July 7, 1943.

As the closed-shop contract of the UAW covered Willow Run, all of the workers at the plant were union members. The peak membership—about 36,000 workers—was attained in September 1943. Later the membership of the local fell as employment at the plant declined. By autumn, 1945, the membership was down to about 1,500 workers, consisting of the maintenance and repair crew still employed at the plant. The future of the local is uncertain and the charter may revert to the international union.

The local rendered many services beyond the basic duties of collective bargaining and settlement of grievances. Among them were a semimonthly newspaper, "Bombardier," published from June 24, 1942, through June 15, 1945, and a semimonthly bulletin, "The Propeller," designed to inform the members as to their rights as employees, workmen's compensation benefits, War Manpower Commission regulations, etc. The education department, with an active educational director since early 1942, gave courses in collective bargaining, union procedure, time study, and labor history, and conducted weekly town-hall meetings and round-table discussions.

The Recreational Department, with a full-time director from June 1942 till November 1944, organized clubs for members interested in various forms of recreation and classes in the arts.

Workers of Willow Run

In July 1943 employment at Willow Run reached its peak of over 42,000 workers. From then until April 1945 it declined at a rate which during a few months exceeded 1,000 per month; in many months, however, the decline was less than 500. The reduction through the first quarter of 1945 appears to have been due to "natural" attrition; that is, workers were leaving for whom no replacements (on a net basis) were obtained. In April 1945, lay-offs began which reduced employment by many thousands. On May 26, when the group for this survey was selected, 11,557 workers were employed; only 5,872 were still employed by June 7 and 3,167 on July 30.

This survey was made in June 1945 as a part of the Bureau's general program for following the work and wage experience of individual workers. The 307 workers who constitute the sample upon which the study is based are believed to be representative of the 7,400 production workers (exclusive of skilled maintenance workers, tool and die makers, and office workers) who were still employed at the plant at the end

of May 1945.[3] It is less likely that the 307 workers form a representative cross-section of Willow Run's labor force prior to the major lay-off. Probably more workers at the peak of the plant's activity came from the Southern States, were to a larger extent farmers, and had somewhat less formal education—to cite but a few differentiating factors. For these reasons it should be borne in mind that the findings here set forth relate only to Willow Run at the end of May 1945, with 7,400 persons at work exclusive of skilled maintenance employees and office workers.

SEX, AGE, AND PHYSICAL CONDITION OF WORKERS

The majority of the workers of Willow Run were men although approximately 4 out of every 10 employees were women. Among the 307 workers surveyed, nearly 10 percent were Negroes.[4] Men as young as 19 and as old as 71 were employed; the age range for women was from 21 to 65 years. The median age of men (37 years) was somewhat higher than that of women (34 years). Only 16 percent of the men were under 30 years, the group most vulnerable to draft

TABLE 1.—*Age, Color, and Sex of Willow Run Workers, as of May 1945*

Age	Total		White [1]		Negro		Percentage distribution	
	Men	Women	Men	Women	Men	Women	Men	Women
Total workers in sample	179	128	163	117	16	11	100	100
Under 15 years								
15–19 years	2		2				1.1	
20–24 years	4	15	4	14		1	2.2	11.7
25–29 years	23	30	21	25	2	5	12.8	23.4
30–34 years	45	21	43	18	2	3	25.1	16.4
35–39 years	27	23	26	21	1	2	15.1	18.0
40–44 years	24	17	20	17	4		13.4	13.3
45–49 years	17	14	16	14	1		9.5	10.9
50–54 years	22	5	19	5	3		12.3	3.9
55–59 years	8		6		2		4.5	
60–64 years	6	2	5	2	1		3.4	1.6
65 years and over	1	1	1	1			.6	.8

[1] Includes 1 Mexican.

into the armed forces.[5] Of more immediate interest from the viewpoint of reemployment of these workers, nearly 21 percent of the men were aged 50 years or more but only 6 percent of the women were in this

[3] The sample of 307 workers used in this study was drawn from the company's seniority lists coverin 7,400 production workers. These lists were arranged by occupational groupings, the workers being listed by seniority under each group irrespective of sex, color, department, or alphabetical spelling of name. By choosing every twelfth name on these lists, 614 workers' names were drawn. The workers' addresses were obtained from the personnel files of the company. From this group of 614 every other name was chosen yielding the sample of 307. In effect, therefore, the sample consists of every 24th name on the seniority lists. The remaining 307 names were held in reserve to make substitutions. If a change was necessary, either because a worker could not be found or because he lived too far away to be visited, the substitute selected was one in the same occupation and whenever possible, from the same locality, as the originally chosen worker.

The sample of 307 workers showed 179 men (58.3 percent) and 128 women (41.7 percent). This proportion corresponds closely to the ratio of men and women laid off as of June 7, 1945. The difference between the group of 7,400 production workers from which the sample was selected and the total employment of 11,557 at the plant on May 26, 1945, represents male workers who, if included, would have raised the ratio of men to women.

The company and union (Local 50, UAW-CIO) were informed in advance as to the nature and purpose of this survey. The Bureau's field representatives interviewed the workers at their homes.

[4] The proportion of Negroes in the BLS sample (10 percent) compares with an estimate, obtained from other sources, of not more than 2 percent. This discrepancy was due to the timing of the BLS study. Most of the Negro workers were transferees from other Ford plants and were the last to be laid off. Hence, as the newly hired workers were dismissed because of cut-backs, the ratio of Negroes to whites increased because the number of Negro workers remained comparatively unchanged.

[5] As of the end of July 1945 nearly 11,000 workers were on military leave from Willow Run, according to reports made by company officials to the U. S. Employment Service. The low proportion of draft-age men in the BLS sample suggests that eligible men in this age group had already been withdrawn for military service.

older age group. The group of workers 40 years or over included nearly 44 percent of the men and 30 percent of the women. Thus, although the great majority of the workers were in the most employable ages, considerable numbers were of an age which, under unfavorable market conditions, might constitute a handicap to reemployment.

Some of the older workers, of course, entered industry only for the "duration" and intended to withdraw from the labor market upon lay-off from Willow Run. Thus, R. A., a 63-year-old woman, worked at Willow Run as a sewing-machine operator. She indicated that she was "tired of working in a factory and was anxious to get back to housekeeping." On the other hand, for A. H. who, despite his 71 years, was able to perform the work of paper-pattern maker on B–24's, continued employment was an economic necessity. The follow-up survey will be able to report his success in finding a job at light machine work, his indicated preference. Some of the older workers who transferred from other Ford plants to Willow Run had sufficient seniority to give them some assurance of reemployment. J. R., aged 59, who was a machine operator at Willow Run expected to get similar work at the River Rouge plant. S. K., a punch-press operator, aged 57, thought that work would be available for him at Ford's Flat Rock plant. On the other hand, H. W., aged 61, was pessimistic about the prospects of reemployment at factory work. Although he owned a home in the Detroit area and preferred to remain in the community and work in some plant, he felt that he might be forced to return to farming.

A surprisingly large proportion of workers in the group—20.6 percent of the men and 9.4 percent of the women—admitted having physical disabilities which limited them in job selections. These disabilities included heart trouble, anemia, high blood pressure, partial or total blindness, partial or total deafness, pulmonary disease, injuries to body, arms, and legs, and allergies to dust, paint, and oils. A relatively smaller group indicated that they had veteran status, a factor which might serve to give them preferential treatment in hiring. None of the women were veterans and only 7 percent of the men.[6] It should be noted that the veterans and the workers with physical disabilities are not necessarily the same.

EXTENT OF EDUCATION AND TRAINING

As might be expected, the workers who were between 20 and 44 years old had more formal education than those 45 years of age and older. More than half (56.4 percent) of the 20 to 44 age group had 1 to 4 years of high school, whereas the majority (55 percent) of the workers aged 45 and over had 5 to 8 years of grade school and only slightly more than a quarter (28 percent) of this older group had 1 to 4 years of high school. In the younger group 9 percent of the workers had gone through a year or more of college, compared with only 5 percent of the older group.

The survey also disclosed a significant difference with respect to the formal education of men and women. In the age bracket 20 to 44 years the men had acquired more college education than the women. Thus, nearly two-thirds of the women had 1 to 4 years of high school and 6 percent a year or more of college; of the men, 51 percent had

[6] The number of veterans will be much higher than these figures indicate after the 11,000 workers on military leave are discharged from the armed forces.

comparable high-school training but 11 percent had some college training, or almost twice the proportion of women. In the older age group relatively more men than women had college education, but the proportion of women who had completed 1 to 4 years of high school (36 percent) was greater than that of men (24 percent).

TABLE 2.—*Age, Education and Sex of Willow Run Workers, as of May 1945*

Age and year of education completed	Total		Men		Women	
	Number	Percent	Number	Percent	Number	Percent
Total workers in sample	307		179		128	
Under 20 years of age	2	100	2	100		
High school, 1–4 years	2	100	2	100		
20–44 years of age	229	100	123	100	106	100
Grade school, 1–4 years	3	1.3	3	2.4		
Grade school, 5–8 years	77	33.6	43	35.0	34	32.0
High school, 1–4 years	129	56.4	63	51.2	66	62.3
College, 1 year or more	20	8.7	14	11.4	6	5.7
45 years of age and over [1]	76	100	54	100	22	100
Grade school, 1–4 years	6	7.9	6	11.0		
Grade school, 5–8 years	42	55.3	29	53.6	13	59.1
High school, 1–4 years	21	27.6	13	24.1	8	36.4
College, 1 year or more	4	5.3	3	5.6	1	4.5
No education	2	2.6	2	3.7		
Education not reported	1	1.3	1	1.9		

[1] Includes persons whose age was not reported.

None of the workers studied was employed in a professional or semiprofessional capacity at Willow Run, but rather surprisingly almost 8 percent had some college training. Although it is not known how many of these workers regard industrial employment as their main source of livelihood, it is probable that a fair number took factory jobs only for the war period. Thus, Mr. L. B., a pastor, took a production job at Willow Run but expected to return to his pulpit when he was laid off from the plant.

From the evidence gathered regarding vocational training, it appears that on-the-job experience rather than trade schools provided the necessary skills for the workers surveyed. Prior to January 1941, 291 of the 307 workers had no formal trade or vocational training and only 16 had taken some schooling in industrial employments. After January 1941 a slightly larger number, 20, had some formal industrial training but the overwhelming number still depended on the acquisition of skills while on the job, including riveters and welders who were given short training courses in the plant.

FAMILY STATUS

As married persons and those with dependents are perforce under great economic pressure to secure a steady flow of income, it is of interest that more than two-thirds of the workers studied were married, nearly two-thirds were heads of families [7] with one or more

[7] Only one person was considered as "head of family" in cases in which a group of people, related by blood, marriage, or adoption, lived together as part of a single household. An adult scheduled worker, living with his or her parents and paying a fixed sum regularly for room and board, was not considered as head of the family if one of the parents normally contributed substantially to the finances of the household; no worker was considered as head of a family, even though he had a wife and children living with him, if he resided in his (or his wife's) parents' house. On the other hand, a worker was scheduled as head of the family, even if the other family members were not presently living in the same household with him (e. g., because his job was too distant from home), provided he was the recognized head of the family group for which he was responsible. Economically independent persons living alone or boarding with unrelated persons were considered to be heads of "one-person families."

dependents, and slightly more than half of the workers had one or more children under 15 years of age. A third of the workers had no dependents while somewhat over a fourth (28 percent) indicated that they were responsible for the support of three or more persons.

TABLE 3.—*Marital Status and Family Composition of Willow Run Workers, by Sex, as of May 1945*

Item	Number of workers			
	Men	Women	Total	
			Number	Percent
Marital status:				
Single	27	29	56	18.2
Married	141	70	211	68.7
Other [1]	11	29	40	13.1
Family heads:				
1-person families	17	20	37	12.1
Other families, worker head	156	37	193	62.9
Other families, worker not head	6	71	77	25.0
Family composition:				
1-person families	17	20	37	12.1
Worker and spouse only	30	18	48	15.6
Other 2-person families	5	18	23	7.5
3-person families	43	19	62	20.2
4-person families	34	20	54	17.6
5-person families	27	17	44	14.3
6-person families	11	5	16	5.2
7-person families	8	5	13	4.2
8-person families	3	6	9	2.9
9 or more person families	1	0	1	.4
Number of children: [2]				
No children under 15 years [3]			147	47.9
One or more children under 15 years			160	52.1
Dependents of workers:				
No dependents	23	88	111	36.2
1 dependent	38	19	57	18.6
2 dependents	43	9	52	16.9
3 dependents	32	6	38	12.4
4 dependents	27	5	32	10.4
5 dependents	7	1	8	2.6
6 dependents	6		6	2.0
7 dependents	1		1	.2
8 or more dependents	2		2	.7

[1] Widowed, divorced, and separated.
[2] The children reported are not necessarily those of the workers scheduled but include all children within a family, as defined.
[3] Includes 1-person families. The number of families is therefore the same as the number of workers.

Although the greater number of the workers lived with their families within commuting distance of the bomber plant, others were maintaining two households because their dependents were left behind in another city or on farms. For example, B. L., a widower employed as a spray painter, supported an aunt aged 80 and a niece aged 37, both of whom lived in the South.

Most of the men interviewed (70 percent) were the only employed members of their families. Fewer women (30 percent) than men, as might be expected, were in family groups for which they were the sole wage earners. More than half of the women but only 20 percent of the men were members of families having one or more other persons employed.

Migration of Workers

The survey endeavored to ascertain, among other things, where the workers of Willow Run came from, what kinds of communities they had lived in, what it cost them to move, what improvement in

earnings resulted from their change in residence and occupation, and whether family obligations had been an impediment to migration.

Of the sample of 307 workers employed at Willow Run at the end of May 1945, 55 or 18 percent indicated that their place of residence at the beginning of the year 1941 had been outside Michigan. Because many workers moved with their families, the migration of these 55 workers brought a total of 173 persons to Michigan. From four other Great Lakes States (Indiana, Illinois, Ohio, and Wisconsin) came 5 percent of the workers; seven Southern States, including Arkansas, provided almost 10 percent of the migrants, but less than 2 percent came from the East (New York and Pennsylvania).

TABLE 4.—*State of Residence of Willow Run Workers, as of January 1941*

Region and State of residence	Number of workers	Percent	Region and State of residence	Number of workers	Percent
All workers in sample	307	100.0	Midwest:		
			Missouri	4	1.3
Great Lakes:			South:		
Michigan	252	82.1	Arkansas	6	2.0
Indiana	4	1.3	Florida	2	.6
Illinois	4	1.3	Georgia	2	.6
Ohio	7	2.3	Kentucky	9	2.9
Wisconsin	1	.3	Tennessee	6	2.0
East:			Texas	4	1.3
New York	3	1.1	West Virginia	1	.3
Pennsylvania	2	.6			

Viewing the migration merely in terms of the State of residence of these workers tends to obscure the actual distances involved between the workers' prewar location and Willow Run. Thus, although Michigan provided 82 percent of the workers, only 72 percent came from communities within 50 miles of Ypsilanti (home of Willow Run), slightly over 3 percent came from a distance of 50 to 100 miles, and 18 percent from a distance of 100 to 500 miles, while for 8 percent of the workers the move covered over 500 miles.

Because of the marked decline in employment, it is probable that many workers whose homes were outside Michigan or at a great distance from the Detroit area had already left the region by the time of this survey (June 1945). The proportion of migrants in the labor force of Willow Run before the large cut-backs may, therefore, have been much higher than the figures based on this particular sample indicate.

The workers of Willow Run, irrespective of their State of residence at the beginning of the war, were largely small-town folk. In January 1941 nearly a third of the 307 workers lived in communities of under 10,000 population (which includes rural areas) and slightly more than three-fifths in communities of under 50,000 population. The larger cities of 250,000 and over accounted for less than a fourth of the workers; most of this group came from Detroit.

For practically all (89 percent) of the 104 workers in the group whose employment at Willow Run involved a transfer of residence from one city to another, this was the only migration since January 1941. Approximately 8 percent of the workers moved twice, while the remaining small group moved three or more times. Of this last group, the case of R. K. is typical. He moved with his wife and 3 young children from New Mexico to Arkansas, then to Texas, and

finally to Michigan. It is apparent however, that for most of the workers surveyed, the wartime shift was essentially one journey, without intermediate stops, from their prewar places of residence to work in the Detroit area. Not all of these workers actually lived in Willow Run project while employed at the plant, although most of them settled in and around the Detroit area.

TABLE 5.—*Size of Community in Which Willow Run Workers Lived in January 1941 and Distance From Willow Run*

Item	Number of workers	Percent
Size of community in which worker lived in January 1941:		
Under 10,000 population [1]	95	31.0
10,000 and under 50,000 population	90	29.4
50,000 and under 100,000 population	26	8.5
100,000 and under 250,000 population	12	3.8
250,000 population and over	71	23.1
Size of place not reported	13	4.2
Total	307	100
Approximate distance between worker's residence in January 1941 and Willow Run:		
Same community	37	12.0
Different community but within 50 miles	183	59.6
50 to 100 miles	10	3.3
100 to 500 miles	54	17.6
500 to 1,000 miles	17	5.5
Over 1,000 miles	6	2.0
Total	307	100

[1] Includes rural areas.

Four out of five moves made by single persons without dependents cost under $25; for the rest of the workers in this category the cost per move was between $25 and $50. It cost S. A. $10 and C. M. $12 to reach Willow Run from towns in Kentucky. Both were single and without dependents. Heads of families were faced with greater expenses because they usually moved their dependents and part or all of their belongings. B. J. was able to keep down to $67 the cost of moving himself, his wife, mother-in-law, three sons, and two daughters from Lansing to Wayne, Mich. R. K.'s migrations (cited above) between New Mexico, Arkansas, Texas, and Michigan, cost $200 each. A third of the migrations made by heads of families required less than $25 each but for almost a fourth of the moves, the expenses were in excess of $100.

The greater cost incurred in moving a family was undoubtedly an important deterrent to migration. It may also be assumed that the difficulties of obtaining adequate housing accommodations in the war-crowded Detroit area were given greater consideration by married persons and others with dependents than by single men and women; 42.8 percent of the single persons moved, as compared with 30.3 percent of the married group. Workers in families of three or more were also less mobile than workers in smaller-size family groups. The number of women moving was greater, in relation to their representation in the sample, than that of men; this, again, may be explained largely by the fact that greater proportions of men than women were married.

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TABLE 6.—*Approximate Cost of Migration of Willow Run Workers*

Approximate cost of each migration	Percent of workers			
	All workers	One-person families	Other heads of families	Other workers
Under $25	49.5	80.6	32.8	53.6
$25 but under $50	23.1	19.4	29.6	11.9
$50 but under $75	10.7		12.7	19.2
$75 but under $100	3.3		3.1	7.7
$100 but under $200	8.5		14.0	3.8
$200 and over	4.9		7.8	3.8
Total	100.0	100.0	100.0	100.0
Number of moves reported	121	31	64	26

Most of the Negroes employed at Willow Run were transferees from Ford's River Rouge Plant and Ford's Generator Plant in Ypsilanti, and were therefore already living in the general vicinity of Willow Run. This explains why the proportion of Negroes in the migrant group was found to be considerably less than that of whites.

TABLE 7.—*Characteristics of Willow Run Workers Who Moved From One City to Another Between January 1941 and May 1945*

Characteristics	Total sample	Workers who moved		Characteristics	Total sample	Workers who moved	
		Number	Percent of sample			Number	Percent of sample
Total number of workers	307	104	33.9	Marital status: [1]			
Sex:				Single	56	24	42.8
Men	179	53	29.6	Married	211	64	30.3
Women	128	51	39.8	Other [2]	40	16	40.0
Color:				Family head: [1]			
White	280	100	35.7	1-person families	37	25	67.6
Negro	27	4	14.8	Other family head	193	55	28.5
Age: [1]				Not head of family	77	24	31.2
Under 20 years	2	1	50.0	Size of family: [1]			
20–44 years	229	78	34.0	1-person families	37	25	67.6
45 years and over	76	25	32.9	2-person families	71	24	33.8
				3 to 5-person families	160	46	28.8
				6 or more person families	39	9	23.1

[1] As of May 1945.
[2] Widowed, divorced, separated.

The reasons for the migration of workers to Willow Run are undoubtedly as complex and varied as the workers themselves. For many, if not most, the high wages paid in the Detroit area must have been a strong inducement. For nearly three-fourths of the migrants, gross weekly earnings increased as a result of the change.

Of the 307 workers surveyed, less than 4 percent planned no postwar migration. This small proportion probably consisted of workers who lived in Willow Run project or in close-by Ypsilanti. Most of the workers, 274 or 89 percent, reported that they intended to move to another city within Michigan, and 21 others planned to leave Michigan for 15 other States and Hawaii. One worker who expected to change his State of residence was not certain where he would go.

Employment Pattern

INDUSTRIES FROM WHICH WORKERS WERE DRAWN

Farms and factories, schools, professions, and trade were the sources from which Willow Run drew its manpower. In January 1941, 7 out of every 10 of the 307 workers surveyed were employed in gainful occupations. Workers who were seeking but unable to find employment formed slightly over 3 percent of the sample. About 2 out of 10 persons were not in the labor market; these included housewives, students, and members of the armed forces.

The factories, as might be expected, furnished the largest proportion of workers. Manufacturing industries accounted for nearly 40 percent of the 307 bomber-plant workers, with the automobile and automobile-equipment industries supplying over 25 percent.[8] A large number of these workers had transferred from Ford's River Rouge Plant in Dearborn and Ford's Generator Plant in Ypsilanti.

Other manufacturing industries whose processes would appear to be only remotely related to the production of aircraft employed nearly 14 percent of the workers at the beginning of 1941. These industries included food, apparel, textiles, printing and publishing, chemicals, and leather.

TABLE 8.—*Industrial Status of Willow Run Workers, By Sex, as of January 1941*

Status, as of January 1941	Men	Women	Total	
			Number	Percent
Total workers surveyed	179	128	307	100.0
Employed	159	54	213	69.4
Finance, insurance, real estate	2		2	.7
Mining	2		2	.7
Government	5		5	1.6
Transportation, communication, and public utilities	6	1	7	2.3
Agriculture	8	2	10	3.3
Construction	11	1	12	3.9
Services	11	14	25	8.1
Wholesale and retail trade	10	18	28	9.1
Manufacturing	104	18	122	39.7
Automobiles and auto equipment	72	8	80	25.9
Iron and steel	14		14	4.6
Paper	5	1	6	2.0
Food	4		4	1.3
Transportation equipment (except autos)	4		4	1.3
Apparel		3	3	1.0
Textile-mill products	1	1	2	.7
Printing and publishing		2	2	.7
Stone, clay, and glass	1	1	2	.7
Ordnance and accessories	1		1	.3
Chemicals	1		1	.3
Leather		1	1	.3
Machinery (except electrical)	1		1	.3
Miscellaneous manufacturing		1	1	.3
Unemployed	20	74	94	30.6
Unemployed, seeking work	4	6	10	3.3
Housewives		47	47	15.3
Students	3	6	9	2.9
Military service	1		1	.3
Other	2		2	.7
Detail not reported	10	15	25	8.1

Work at Willow Run must have involved an even greater adjustment for the nearly 30 percent of the workers who came from non-

[8] The proportion of former automobile workers in the sample may be somewhat higher than the relative number before the cut-backs. Since many of these automobile workers had acquired considerable seniority, they were probably among the last to be laid off.

manufacturing industries. Of this group, wholesale and retail trade provided the largest proportion, 9.2 percent. From the service trades came 8.1 percent of the workers, 3.9 percent from construction, 3.3 percent from agriculture and 2.3 percent from transportation, communication, and public utilities. Less than 2 percent were drawn from government employment and less than 1 percent from mining and finance, respectively.

JOB CHANGES, JANUARY 1941–MAY 1945

For three-fourths of the workers with prewar employment experience, only one change in employers took place between January 1941 and May 1945.[9] C. H., for example, who was working as a truck driver for a county road commission in Michigan at the beginning of the war, shifted to Willow Run in May 1942 and was still at the plant when interviewed. T. R. was a housewife who had never been gainfully employed until August 1942 when she took her first and only job as crib attendant at the bomber plant. For nearly two-thirds of the workers who were not employed in January 1941, Willow Run was their source of employment throughout the period surveyed.

TABLE 9.—*Changes in Employment of Willow Run Workers, January 1941 to May 1945*

Item	Total		Workers employed in January 1941		Workers not employed in January 1941 [2]	
	Number	Percent	Number	Percent	Number	Percent
Number of changes of employer: [1]						
No change	59	19.2			59	62.7
1 change	188	61.2	160	75.1	28	29.8
2 changes	45	14.7	40	18.8	5	5.3
3 changes	10	3.3	9	4.2	1	1.1
4 changes	5	1.6	4	1.9	1	1.1
Total	307	100	213	100	94	100
Number of job changes: [3]						
No change	38	12.4			38	40.4
1 change	145	47.2	102	47.9	43	45.7
2 changes	70	22.8	63	29.6	7	7.4
3 changes	37	12.0	33	15.5	4	4.3
4 changes	14	4.6	13	6.1	1	1.1
5 changes	3	1.0	2	.9	1	1.1
Total	307	100	213	100	94	100

[1] Includes changes from one plant or employer to another.
[2] Includes workers whose employment status in January 1941 was not reported.
[3] All changes counted including changes in grade within same occupation but not changes in rate in same occupation.

In view of the high rate of labor turn-over during the war, and especially in war industries, the relative stability of Willow Run's labor force revealed above may seem somewhat surprising. The explanation may lie in (1) the relatively high wages paid at the bomber plant, which provided a strong inducement for workers to remain on the job, and (2) the fact that at the time of this survey employment at Willow Run had already been cut drastically, so that the sample data may understate somewhat the usual rate of turn-over. The workers who came to Willow Run late in the plant's short history

[9] Changes from one plant as well as from one employer to another were included in the count as changes in employers. Consequently, if a worker shifted from the Ford River Rouge Plant to the Ford-operated Willow Run, this change was considered a change in employers.

were probably those who had made many changes in employers. Since they also had the lowest seniority rating, they were among the first to be laid off and, consequently, may not be adequately represented in the sample studied.

Many more workers changed jobs than changed employers. Some of these changes involved upgrading within the same occupation; in other instances workers moved from one occupation to another.[10] All of the workers with prewar experience changed jobs at least once; for more than half of this group there were two or more such changes. The new entrants into the labor market made fewer job changes; 40 percent of them in May 1945 were still in the jobs for which they were originally hired, and 45.7 percent had changed jobs once. While nearly a fourth of the workers with prewar industrial status held four or more different jobs during the period covered, less than 7 percent of the new entrants had a comparable experience.

The following excerpts drawn from the records collected in this study illustrate some of the types of job changes found. Here, as in previous references, the initials used are fictitious.

D. D. was a door hanger at Ford's River Rouge Plant from 1941 until February 1942. His last rate of pay at that job was $1.15. Transferred to Willow Run at the same rate, he worked as an inspector for 7 months. At the end of this period his rate was raised to $1.25. He was then promoted to working foreman at $1.45 an hour; by May 1945 he was earning $1.59. By the end of May, he was demoted to inspector at $1.30 per hour.

D. B., another Ford transferee from River Rouge where he was a punch-press operator, Class B, became a stock-crib attendant and, later, a route operator at Willow Run. His rate of pay, $1.20 an hour, was the same for all three jobs.

Mrs. S. A.'s employment history is a complicated one. For 1 month in 1941 she worked as a porter for a newspaper; she then became a braider for a cable and wire company. The change in jobs raised her rate from 40 cents to 73 cents an hour. She worked 7 months as a braider, then had 6 months of unemployment after which she returned to her last job at the same rate. After 3 months she moved on to Willow Run where she became first a pneumatic riveter, then an assembler, class C, and finally an assembler, class B. Her entrance rate at the bomber plant was 85 cents which was automatically raised to $1.15.

OCCUPATIONS AT WILLOW RUN

At Willow Run all but 17 percent of the 307 workers were engaged in production work. The 17 percent were plant clerical workers [11] on jobs designated by the company as material disposition, material-control checker, stock-discrepancy adjuster, and maintenance clerk. Most of the production workers were concentrated in two relatively unskilled occupations—riveters and rivet repairers (23 percent) and class C assemblers (20 percent). The remaining 40 percent of the workers were assigned to a varied group of 45 different jobs including class B assemblers, polishers, power-saw operators, hand sewers, truck drivers, and power truckers. Because the sample excluded skilled maintenance workers and tool and die makers, none of the workers surveyed were in these highly skilled jobs.

Although practically none of the workers who produced Liberator bombers at Willow Run had worked in aircraft factories prior to the war, most of those surveyed had had some kind of industrial experience. This experience varied from that of workers in automotive plants to marble and granite cutters, dressmakers, and printers. Of the 228

[10] Changes in rates for the same occupation were not considered as changes in jobs.
[11] This survey excluded general office workers.

workers with a prewar employment history, 149 or 65 percent were in the craftsman and manual-worker category. All but 13 of the 149 took work at factory or production jobs at Willow Run; the 13 were engaged in the plant at clerical jobs.

For the dressmaker who became an assembler of B–24 bomber parts and for the printer who became a riveter, the new job required new types of training and adjustment of skills. Despite these differences between the worker's prewar and war jobs, both jobs were subject to an industrial discipline. The bridge between the prewar employments of the remaining 79 men and women and their work at Willow Run was considerably greater. For example, 7 reported their usual occupations to be in the professional and semiprofessional class, such as teachers, musicians, nurses, and dental assistants. One worker had been a pastor of a church. Six out of the 7 took production jobs at Willow Run and 1 took a clerical job.

TABLE 10.—*Changes in Occupational Status of Willow Run Workers with Prewar Employment Experience*

Occupational group	Usual occupational group	Occupational group at Willow Run		Usual occupational group	Occupational group at Willow Run	
		Clerical	Craftsmen and manual workers		Clerical	Craftsmen and manual workers
	Men			Women		
All groups	173	29	144	55	13	42
Professional and semiprofessional	4		4	3	1	2
Proprietors, managers, and officials (except farmers)	5		5	1		1
Farmers and farm laborers	11	1	10			
Clerical, sales, and kindred workers	26	15	11	16	10	6
Service [1]	4	1	3	9	1	8
Craftsmen and manual workers	123	12	111	26	1	25

[1] Includes protective, domestic, and personal service workers; also building service workers and porters.

All of the 6 workers whose usual occupations were those of proprietors or managers became craftsmen or manual workers at Willow Run. Their prewar activities included the management of a bowling alley, a general store, a poolroom, a florist shop, and a restaurant.

It is not known how many of the 11 workers who were farmers by occupation actually owned their own farms or were merely farm laborers. Ten of the 11 took production jobs at Willow Run, and 1 became a clerical worker.

A less drastic shift in type of employment is indicated for those workers who were clerks or sales employees prior to the war. Twenty-five of the 42 who came to Willow Run from clerical or sales employments took clerical jobs at the plant. Two of the 13 prewar workers in service occupations were employed at clerical jobs at Willow Run; 11 were hired as craftsmen and manual workers.

To many of the workers at Willow Run participation in union organization must have been as new and strange as their adjustment to the industrial discipline of the immense plant. Of the 307 workers surveyed, 186 or 60 percent had never been members of any union prior to January 1941. However, union membership was relatively new to only 40 percent of the men. Nearly all (89 percent) of the

women, on the other hand, had no experience as union members prior to the war. In interpreting the marked difference in union experience between men and women, it is important to bear in mind that a larger proportion of women had only recently entered the labor market.

Wartime Wages

The earnings of Willow Run workers, like those of most persons employed in war production, were relatively good while they lasted. In 1943 the average annual wage income of the workers surveyed was $3,137.[12] This compares with an average annual wage of $3,191 in the same year for all workers in Michigan employed in war manufacturing industries; for all workers in the United States in the same types of activity the comparable figure was $2,745.[13]

The annual earnings of men at Willow Run were substantially higher than those of women in 1943, largely because of three factors: (a) Some of the women had only recently entered the labor market and did not work a full year in 1943, (b) more men than women worked the seventh day each week at double time, and (c) more men than women were employed at the higher grades of skill within the same general occupations. The higher-paid occupations, such as working foremen, were in the main filled by men. Thus, in 1943 earnings of men averaged $3,376 and those of women, $2,792 (table 11). Almost two-thirds of the men had incomes between $3,000 and $4,000, while for 13 percent the average was over $4,000. Slightly less than half of the women earned between $3,000 and $4,000 and none above $4,000.

In 1944 more women worked a full year and more received hourly rates above the starting amount. As a result, the survey disclosed that the annual income of women rose from $2,792 to $2,928 between 1943 and 1944, a gain of 5 percent, while the annual earnings of men declined slightly owing, probably, to the reduction in overtime. The proportion of men in the $3,000–$4,000 income class increased from 64 percent to 77 percent between 1943 and 1944 but in the next bracket of $4,000 and over there was a decline from 13 percent to

TABLE 11.—*Annual Wage Income of Willow Run Workers, 1943 and 1944*[1]

Income class	Total		Men		Women	
	1944	1943	1944	1943	1944	1943
Under $500		1				1
$500 and under $1,000	1	2		1	1	1
$1,000 and under $1,500	3	3	1	1	2	2
$1,500 and under $2,000	3	16	1	6	2	10
$2,000 and under $2,500	15	24	5	9	10	15
$2,500 and under $3,000	53	47	17	19	36	28
$3,000 and under $3,500	129	87	79	46	50	41
$3,500 and under $4,000	47	62	41	53	6	9
$4,000 and under $4,500	6	12	6	12		
$4,500 and under $5,000	4	6	4	6		
$5,000 and over	1	2	1	2		
Average annual wage income	$3,185	$3,137	$3,363	$3,376	$2,928	$2,792
Total number of workers reporting for both years	262	262	155	155	107	107

[1] Excludes skilled maintenance workers, tool and die makers, and office workers.

[12] If skilled maintenance men and tool and die makers had been included in the sample, the computed average annual income would have been higher than $3,137, despite the fact that the survey also excluded office workers.

[13] See State Income Payments in 1943, by Charles F. Schwartz, in Survey of Current Business (U. S. Bureau of Foreign and Domestic Commerce, Washington), August 1944 (p. 12).

7 percent. The concentration of women in the $3,000–$4,000 class increased from slightly under to somewhat over 50 percent but, as in 1943, no women reported incomes over $4,000.

It is impossible to estimate at the present time what the annual wage income of Willow Run workers was in 1945 because of the cessation of production at the bomber plant in the middle of the year, the shift of some workers to other employments, others to unemployment, and the withdrawal of a small number from the labor market. It is expected, however, that as a result of future follow-up studies it will be possible at a later time to trace the employment and wage experience of the workers of Willow Run. Those workers who remain in the labor market will undoubtedly make strong efforts to obtain wages at their new employment at least comparable to the level of earnings at Willow Run. It is therefore of interest to examine the going rates of pay and weekly earnings at the bomber plant at the time of this survey.

At the end of May 1945, women received on the average $1.14 per hour and men, $1.19 per hour. These figures are for straight-time pay and exclude overtime compensated for at premium rates. Inexperienced workers at Willow Run were paid a beginning rate of 85 cents an hour in 1945. After a specified period, under terms of the union contract covering seniority and merit increases, these workers received the "going rates" for their jobs, most of which ranged from $1.02 to $1.20 per hour. Workers in the semiskilled category had a rate range from $1.20 to $1.40 an hour and workers in the skilled classifications were paid from $1.40 to $1.85 per hour. At the time of this survey 58 percent of the workers surveyed were paid the unskilled rate of $1.15 per hour. Slightly more than a third of the workers received the semiskilled rate of $1.20 to $1.40 per hour, and only one worker was found in the skilled-rate bracket. The small representation in the highest rate class is due to the fact that the sample excluded skilled maintenance men and tool and die makers.

The hourly rate of pay received by most Willow Run workers with prewar employment experience was considerably higher than their rate of pay at the beginning of the war (table 12). All but 18 percent of this group of the workers had an advance in rates. Over an eighth had increases of 50 to 100 percent, for approximately 20 percent the rate more than doubled, and for a little over 10 percent the rate had more than tripled. Over 40 percent of the prewar workers therefore had hourly rate increases of 50 percent or more.

In interpreting these increases in wage rates it is important to bear in mind that in practically all cases in which the increase was substantial the rates at the beginning of the war were low. For example, before coming to Willow Run, B. A. worked for 20 cents an hour as a waitress in a Kentucky restaurant, where she was not permitted to accept tips. Her rate at the bomber plant, $1.15 an hour, was more than five times her prewar rate of pay. A similar situation was found in the case of A. R. who worked as a cook in Pennsylvania for 33 cents an hour. As a riveter at Willow Run she earned $1.15. For the large number of prewar automobile workers who transferred from other Ford plants to Willow Run, the increases were considerably smaller. Before the transfer, many of these workers were receiving around $1.15 an hour. Their new jobs often called for the same rates of pay or rates of about $1.20 and $1.35.

TABLE 12.—*Current Straight-Time Hourly Rates of Willow Run Workers in May 1945, and Change in Rates for Specified Periods*

Item	Men	Women	Total	
			Number	Percent
Straight-time hourly rate:[1]				
Under 90 cents				
90 cents and under $1.00	5	3	8	2.6
$1.00 and under $1.10	11	2	13	4.2
$1.10 and under $1.20	64	113	177	57.6
$1.20 and under $1.30	65	8	73	23.8
$1.30 and under $1.40	33	2	35	11.4
$1.40 and under $1.50	1		1	.4
Total	179	128	307	100.0
Average hourly rate	$1.19	$1.14	$1.17	
Rate change, prewar to May 1945:[2]				
Decrease	13		13	7.5
No change	18		18	10.4
Increase of—				
Under 10 percent	24		24	13.9
10 and under 25 percent	16	2	18	10.4
25 and under 50 percent	20	6	26	15.0
50 and under 75 percent	9	4	13	7.5
75 and under 100 percent	5	4	9	5.2
100 and under 200 percent	13	21	34	19.7
200 and under 300 percent	4	7	11	6.4
300 percent and over	1	6	7	4.0
Total	123	50	173	100.0
Rate change, war period (1942–43 to May 1945):[3]				
Decrease		5	5	6.8
No change	3	42	45	60.6
Increase of—				
Under 10 percent		7	7	9.5
10 and under 25 percent	1		1	1.4
25 and under 50 percent	3		3	4.1
50 and under 75 percent		5	5	6.8
75 and under 100 percent				
100 percent and over	1	7	8	10.8
Total	8	66	74	100.0

[1] Excludes overtime at premium rates.
[2] Includes only workers for whom a definite beginning rate was available, between January and December 1941. If more than one rate was recorded during this period, the rate dated nearest January was used.
[3] Excludes workers tabulated under preceding head, but includes all other workers for whom a beginning rate was available for the period between January 1942 and December 1943.

Although most of the men had prewar employment experience, the wage-earner status of many women was relatively recent. For workers who entered the labor market between January 1942 and December 1943 wage-rate increases were few, largely because they held the same jobs until the plant closed. The data collected indicate that for 61 percent of the workers reporting no prewar earnings, the hourly rate remained unchanged.

Gross weekly earnings averaged $46.02 for women and $48.19 for men at the end of May 1945; for both groups combined, the average was $47.29 (table 13). From data supplied by 294 workers it was found that average weekly deductions for income taxes ($5.62), social security taxes (47 cents), and union dues [14] (25 cents) totaled $6.34. Applying the latter figure to the average gross weekly earnings of the 307 workers, average "take-home" pay (exclusive of war bond deductions) was $40.95 in the period surveyed. It should be recognized that by the end of May 1945 the normal workweek had been reduced from 54 to 40 hours and few of the men and women at Willow Run were working overtime. In 1943 and 1944, on the other hand, there were many weeks when the hours actually worked exceeded 60 for

[14] In accordance with the closed-shop contract and check-off, all workers had $1.00 deducted for union dues from one of their pay checks each month.

TABLE 13.—*Gross Weekly Earnings of Willow Run Workers in May 1945, and Change in Earnings for Specified Periods*

Item	Men	Women	Total	
			Number	Percent
Gross weekly earnings:				
Under $35		1	1	0.3
$35 and under $40	4	3	7	2.3
$40 and under $45	16	35	51	16.6
$45 and under $50	93	79	172	56.0
$50 and under $55	60	6	66	21.5
$55 and under $60	1	2	3	1.0
$60 and under $65	4		4	1.3
$65 and over	1	2	3	1.0
Total	179	128	307	100.0
Average gross weekly earnings	$48.19	$46.02	$47.29	
Change in earnings, prewar to May 1945: [1]				
Decrease	30	1	31	17.9
No change	8	1	9	5.3
Increase of—				
Under 25 percent	39	4	43	24.8
25 and under 50 percent	19	5	24	13.9
50 and under 75 percent	7	4	11	6.4
75 and under 100 percent	9	4	13	7.5
100 and under 125 percent	5	5	10	5.8
125 and under 150 percent		7	7	4.0
150 percent and over	6	19	25	14.4
Total	123	50	173	100.0
Change in earnings, war period (1942–43 to May 1945): [2]				
Decrease	3	24	27	36.5
No change	3	31	34	46.0
Increase of—				
Under 25 percent		2	2	2.7
25 and under 50 percent	1	1	2	2.7
50 and under 75 percent		2	2	2.7
75 and under 100 percent		1	1	1.3
100 percent and over	1	5	6	8.1
Total	8	66	74	100.0

[1] Includes only workers for whom beginning earnings were available between January and December 1941.
[2] Excludes workers tabulated under preceding head, but includes all other workers for whom beginning earnings were available for the period between January 1942 and December 1943.

most men. During those busy times, not uncommonly, workers whose scheduled weekly earnings were around $48 had grossed over $70. By May 1945, however, gross weekly earnings declined, owing to the sharp reduction in hours worked.

Because of the increase in the hourly rate of compensation realized by the majority of the workers at Willow Run, their gross weekly earnings for a 40-hour week in May 1945 were higher than during the year 1941. This statement, of course, refers only to those workers who had prewar employment experience. More than three-fourths of the workers with prewar experience in industry had an advance in earnings; for one-fourth the increase was less than 25 percent, for one-fourth the gain was between 25 and 100 percent, and for an equal proportion the increase was over 100 percent. Eighteen percent of the workers showed a decline in weekly earnings, and 5 percent indicated no change.

It is important to emphasize that many of the increases in weekly earnings, just as many of the gains in hourly rates, reflect a rise from low prewar levels. For the workers whose earnings were relatively high before the war, the improvement in wages was less remarkable. Moreover, it is well known that especially in war-crowded centers, such as the Detroit area, the costs of goods and services rose substantially, thus dissipating some of the increase in earnings.

Postwar Prospects

When the workers were interviewed for this study, the shut-down of Willow Run appeared to be a certainty although numerous rumors were current regarding the probable fate of the great plant. Some of these rumors had it that the plant would be turned into a vast exhibition center, others that it would be reopened for production of industrial equipment of various sorts. It is probable that none of the workers anticipated the reopening under Kaiser management, which was not announced publicly until late in September.

It will be accepted, therefore, that, when the 307 workers were queried at the end of May 1945 regarding their postwar plans, practically all believed that Willow Run, once shut down, would not be a possible source of employment for them, at least in the foreseeable future. However, despite the fact that the thousands of men and women who took jobs at Willow Run knew that the plant was "expendable," the imminent lay-off was bewildering and disturbing. Not all of the workers were prepared to say what their postwar expectations for employment were; many were confused and uncertain.

The case of Mrs. B, who was a drug-store clerk before she became a riveter at Willow Run, reflects this confusion. The interviewer who spoke with this worker shortly after her lay-off from the plant, reported:

> Mrs. B. had the idea of going into business but soon discarded the notion because of the difficulty of obtaining merchandise. She has also been considering the possibility of applying for widow's compensation although she has tried to be independent as long as possible. For the present, at any rate, she is going to remain at her present location and as long as she remains unemployed, she will take care of her home. The only active seeking for a job that she is doing is registering at the unemployment compensation office.

Of the group of 307 workers, 11 men and 12 women were unable to reply to the question of their postwar plans for employment. It is also probable that some of the 35 workers who indicated that they did not expect to change jobs but planned to continue in their present occupations were still confused as to their opportunities as well as their desires for employment. Table 14 summarizes the replies received in response to the question of expected job changes in the postwar period. This table also shows the usual (i. e., prewar) occupations of the workers surveyed and their prospective occupations.

Nearly two-thirds of the workers indicated they expected to change occupations upon leaving the plant. The proportion of men who intended to change (76 percent) was considerably higher than that of women (52 percent). This marked difference between the plans of men and women may have been due to differences in appraisal of employment opportunities in other fields or to the fact that the necessity to plan ahead was less urgent for women than men.

The survey disclosed that not all of the women who before the war were housewives or engaged in other nongainful employments expected to leave the labor market. Only 28 of the 48 women who had no gainful occupation in January 1941 reported that they would return to their former status. The total number who planned to retire as wage earners (47) was almost the same as the number in that group (48) at the beginning of the war. Five of the women who intended leaving were clerks or sales employees, 1 was a service worker, and 10 were factory workers.

TABLE 14.—*Postwar Job Changes Planned by Willow Run Workers*

Prospective job changes	Total	Usual occupational group						
		Professional and semiprofessional	Proprietors, managers, and officials	Farmers and farm laborers	Clerical, sales, and kindred workers	Service workers	Craftsmen and manual workers	No previous gainful occupation
Men	179	5	5	11	28	4	126	
No postwar job changes planned	29			1	7	1	20	
Change of job planned	136	4	5	8	19	2	98	
Professional and semiprofessional	3	3						
Proprietors, managers, and officials	11		1		3		7	
Farmers and farm laborers	8			3			5	
Clerical, sales, and kindred workers	16				9	1	6	
Service workers	1						1	
Craftsmen and manual workers	89	1	3	5	5	1	74	
Not reported	8		1		2		5	
Expect to leave labor market	3	1					2	
Postwar plan not reported	11			2	2	1	6	
Women	128	3	1	2	22	12	40	48
No postwar job changes planned	6			1		2	3	
Change of job planned	66	3	1	1	12	8	24	17
Farmers and farm laborers	1							1
Clerical, sales, and kindred workers	20	1	1		9	1	5	3
Service workers	3			1		1	1	
Craftsmen and manual workers	20	2			1	2	9	6
Not reported	22				2	4	9	7
Expect to leave labor market	44				5	1	10	28
Postwar plan not reported	12				5	1	3	3

This survey revealed that approximately the same number of workers were planning to remain in the labor market as were present at the outset of the war, but a considerable shifting between occupations was contemplated. On the basis of the groupings shown in table 14, nearly 35 percent of the workers intended to change from their usual prewar occupation to another. This did not include prospective interindustry changes; thus, if a worker indicated that he expected to return to his usual job as polisher in a furniture factory, he was classified in the same category—craftsman and manual worker.[15] If the same worker reported he expected to open up a gasoline station, his prospective occupational group was listed as proprietor. Because the data do not reflect contemplated movements from one type of factory or industrial employment to another, it is all the more remarkable that so many workers intended to change occupations.

Among those who intended to leave the labor market, more than half were women whose war work was considered temporary, 2 men and 2 women intended to return to school; the remaining workers were of the older age groups. The desire to increase income was undoubtedly a strong motive inducing change, although the workers differed in their evaluation of the best means to do this. A. F. indicated that "going into business for himself was the only way to make money." Another worker stated that "if he could get the money and the right partners, he would like to open his own machine shop."

[15] An attempt was made to classify the workers surveyed according to the industry to which they intended to return. Owing to the fact that a large number did not reply to this question, the data regarding contemplated interindustry shifts were not sufficiently complete to warrant tabulation.

Evidence collected in the course of this survey, as well as by the U. S. Employment Service in interviewing workers laid off at Willow Run, points to a strong dislike on the part of some workers of the discipline and regimentation encountered in large industrial establishments. One of the men included in this survey reported that "he was sick of working in a plant and did not like to punch a time clock." A worker who intended to return to a farm "justs wants to get away from factory work." Another, who expected to open up a gasoline station, "likes to be his own boss." R. J., another Willow Run worker interviewed, was probably not typical in his desire to shift jobs from factory to clerical work. The reason he gave was that he was "tired of getting cut and dirty hands."

For practically all of the workers, employment of some sort was necessary to their postwar livelihood. In the confused and uncertain situation which these 307 workers found themselves at the end of May 1945, with Willow Run's shut-down imminent and new employment opportunities uncertain, it would not be surprising if events forced a change in plans. What happened to these workers, the work they found, and the wages they earned will be the subject of further study and report by the Bureau.

APPENDIX.—*Work and Wage Experience of Individual Workers*

MIGRANT TO WILLOW RUN

R. K.'s employment history is varied. Now 51, his first full-time job started in 1923 as a farmer. Later he became a carpenter and finally, heavy stock handler at Willow Run. He reported his usual occupation as carpenter in construction work. In the course of his recent working history he has lived in Texas, New Mexico, Arkansas, and Michigan. He is married, has 4 dependents, a wife and 3 children, the latter aged 15, 8, and 5. Moving himself and his family, first from New Mexico to Arkansas, then to Texas, and finally to Ypsilanti, cost Mr. K. approximately $200 each time. His postwar expectations were to stay in the Detroit area and to continue working as a stock handler.

For the period 1926 to 1941, when Mr. K. was a stock farmer in Texas and New Mexico, his earnings are not available. In 1941, when he took up carpentry in Arkansas, his beginning rate was $1.00 per hour; his last rate on this job, in 1943, was $1.50 an hour.

Mr. K. indicated that he quit his carpentry job to make more money at Willow Run. However, both his beginning rate at the bomber plant (85 cents) and his final rate ($1.10) were less than he earned as a carpenter. Apparently, however, he was able to work more regularly, for his annual wage income rose from $3,276 in 1943 to $3,821 in 1944.

Mr. K. was one of the relatively few workers covered in this survey who were members of unions prior to their affiliation with the UAW-CIO at Willow Run. As a carpenter, Mr. K. held membership in the United Brotherhood of Carpenters and Joiners (AFL).

A YOUNG WORKER

A. B.'s employment history is not a long one because he is only 19 and his first job began in June 1943. His record is of interest, however, inasmuch as it illustrates some of the problems of occupational adjustment of a worker who entered the labor market during the war. He is single and without dependents.

Mr. B. finished 1 year of high school and then sought employment. His first job was at the bomber plant as an assembler. He began at 85 cents per hour, and was later raised to $1.15. In preparation for this job he attended plant classes for 4 days where he learned to drill holes, sink rivets, and drill out bent or broken rivets. He had been an assembler less than a month when he was transferred to riveting. His rate of pay remained $1.15. After 3 months the need for assemblers increased and he was transferred back to that type of work. In the 2 years of employment at Willow Run he held 3 jobs, but his rate of pay remained unchanged at $1.15.

Mr. B.'s annual earnings were not reported. When he was on a 54-hour week, his gross weekly earnings were $70.15; on a 40-hour week his earnings were $46.

Factory employment was apparently not to the liking of this new worker. He remarked that he was "tired of getting cut and dirty hands" and would prefer employment at a clerical job.

HOUSEWIFE BECOMES WAGE EARNER

C. M., like many other women, took employment as a wage earner for the "duration" only. Mrs. M. is 36 years of age and until September 1942 was a housewife. She completed 8 years of elementary schooling and had no further education, either vocational or general. Both her son and husband were employed and she had no dependents. In September 1942 she left her home in South Bend, Ind., to work as a waitress in Knox, in the same State. Working 48 hours a week, she received $18 a week plus tips, amounting to $1.50 a day, and meals given without charge.

Seeking higher wages, Mrs. M. moved to a Knox ordnance plant in January 1943 where she was employed as a cartridge loader. Her beginning rate of pay was 60 cents; subsequently, her rate of pay was raised 5 cents.

Her next shift in employment, to Willow Run, gave her a substantial increase in wages. Her starting rate there in June 1943 was 85 cents; under the terms of the union contract, her rate was eventually raised to $1.15 an hour. Her first job at Willow Run was that of hand filer and burrer. Then, because of an infection in her arm, she was transferred to work as an inspector. She held the latter job until April 1945 when she was laid off at Willow Run.

In 1943, Mrs. M. earned $2,306 and in 1944, $2,628. During her last week at Willow Run she earned $46.00 for a 40-hour week. Out of this came $7.40 for income tax, $0.46 for social security taxes and $0.25 for union dues, leaving her $37.89 to take home.

Mrs. M. withdrew from the labor market after the shut-down of Willow Run. She expected to remain a housewife.

RIVER ROUGE TO WILLOW RUN

With the termination of automobile production, many Ford workers of the River Rouge plant were transferred to Willow Run. F. D., aged 31, had been an automobile worker since 1934. In 1941 he was working as a door hanger in the River Rouge plant. Transferred to Willow Run, his first job was that of inspector. In preparation for this work he spent an hour daily studying labor relations, job methods, and the reading of blueprints at the bomber plant. This was done on the company's time and at no cost to him.

F. D.'s experience at Willow Run provides a fairly typical example of temporary wartime additions to earnings resulting from upgrading and long hours of work. He worked as an inspector for 7 months. At first he was able to earn $80.50 per week, working 60 hours at $1.15 per hour. Later his rate was increased to $1.25, but by the time he was promoted from this job his workweek had been reduced to 54 hours, cutting his earnings to $76.25.

In September 1942, F. D. was promoted to working foreman and his hourly rate rose to $1.45. Simultaneously, however, his workweek was reduced to 48 hours and, despite the higher rate, his earnings fell slightly to $75.40. Subsequently, his rate was raised to $1.59, but by May 1945, his working hours had fallen to 40 and his gross weekly earnings to $63.60. In the same month, following the reduction in force, he was downgraded to inspector and his rate was reduced to $1.30 per hour.

A permanent resident of Detroit with established seniority in the Ford Co., Mr. D. expected to remain in the city and to return to work at the River Rouge plant. He did not think it likely that he would be able to make immediate use of his war-acquired experience as inspector and working foreman and anticipated that he would probably have to take up his old job as door hanger.

Out of his wartime earnings, Mr. D. must have been able to provide a fair degree of comfort for his wife and four young children. He reported that he had earned $5,126 in 1943 and $4,500 in 1944. (These figures must include pay for some amount of work beyond his "normal" hours.) The resumption of his old job and the return to peacetime hours of work may well require adjustment of his family's living standards to lower levels of earnings.

A WOMAN WORKER IN INDUSTRY

Mrs. R. A. is one of the thousands of women who are regular members of the labor force. For her, because she is self-supporting, the shut-down of Willow Run means that employment must be sought elsewhere. Mrs. A. was born in Poland; her husband is still there. She received an education in that country roughly equivalent to that of the 9th grade in our schools.

When Mrs. A. arrived in the United States 7 years ago, her first job was as a grocery clerk in Dearborn, Mich. From 1941 until June 1945 she worked at many tasks, starting as a porter for a newspaper at 40 cents an hour and ending as an assembler at Willow Run at $1.15 an hour. Before going to Willow Run she was a braider of wire and cable in Highland Park, Mich., where her rate of pay was 73 cents an hour. Her first Willow Run job, as pneumatic riveter, paid her 85 cents and later, $1.15 an hour. This work was injurious to her health and so her occupation was changed to that of assembler, where she was first paid $1.10 an hour and, after 3 months, $1.15 an hour. Although employed during most of the war period, Mrs. A. found herself out of work from December 1941 to June 1942 after being laid off by the Highland Park Wire Co.

Mrs. A. is a person of ambition and intellectual curiosity. She attended riveting classes at Willow Run and during her unemployment in 1942 took similar courses at the Fordson High School. In addition, she is now attending classes in navigation and meteorology. This latter is purely avocational.

Although there were some periods when Mrs. A.'s gross weekly earnings were $70.15, the cut in hours reduced her average weekly earnings for the year. As a result, in 1943, her wage income was $3,065 and in 1944, $2,892.

Mrs. A. said she would like to remain in factory work after the war and perferably in aircraft manufacturing, if she can find employment.

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Wartime Labor Force of St. Paul Propeller Plant[1]

Summary

CONCERNED for the welfare of the millions of workers recruited for war production, the Bureau of Labor Statistics, in the spring of 1945, undertook a series of surveys designed to disclose the war workers' problems through analysis of their experiences. Among the workers selected for study was a group of 248 employed in a St. Paul propeller plant which shut down soon after hostilities ended in the Pacific war.

The plant was considered typical of many others engaged in a purely war production job. The individual workers were carefully chosen to be representative of the entire 2,300 employed in the plant.

The survey, the results of which are summarized here, was designed to ascertain where these workers came from, why they went into war industry, how they acquired the necessary skills, what changes the war made in their lives, and what were their hopes, expectations and postwar plans. The same workers are to be reinterviewed periodically to determine the effects of reconversion on their economic situation.

Though making propellers when surveyed in April 1945, the group studied was found to consist in large part of prewar farmers, white-collar workers, housewives, businessmen, and professionals. Some of the workers had come to St. Paul from over 500 miles away. Most of them had held several jobs during the war, but few had had formal vocational training. Generally their wartime occupational and industrial shifts had brought substantially increased earnings. When surveyed, they were earning an average of $68.50 per week at the propeller plant. In terms of January 1941 purchasing power, however, their take-home pay averaged less than $40 after allowance for increased living costs, and deductions for taxes and war bonds. Relatively few intended to remain in manufacturing industry after the war. A large proportion of the women workers expected to leave the labor market. Almost a third were planning to leave St. Paul when their jobs ended.

Plant and Community

Although, in the spring of 1940, planes were custom made, British and French orders, and later our own defense program, forced an incredibly rapid transition to mass-production techniques. Propellers, however, were a bottleneck.

Existing techniques of propeller manufacture called for precise metalworking operations. Faced with a shortage of skilled man-

[1] Prepared by Everette B. Harris, Regional Wage Analyst, Chicago Regional Office, Bureau of Labor Statistics, U. S. Department of Labor. A more detailed analysis of the data summarized here is available in mimeographed form.

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power, new methods had to be developed to permit the utilization of quickly trained men and women. A peacetime manufacturer of automobile parts relieved the bottleneck with a process for forging and welding hollow-steel propellers, which could be carried on by workers with little or no factory experience.

With a new process and contracts for production, several months were consumed in finding and equipping a plant. Recruitment of workers began in October 1943.

The propeller plant was ready for production about the time St. Paul-Minneapolis employment reached its wartime peak. A concerted effort by company representatives, the U. S. Employment Service, a number of American Federation of Labor locals, and civic leaders and organizations was necessary to obtain enough workers to start production by January 1944. The National War Labor Board permitted the plant a high wage-rate schedule to speed employment, as a "rare and unusual" case.

Most of the workers were recruited in the Twin Cities, but some came from outside, even from hundreds of miles away. Some 60 percent of the workers originally hired had to be sent to vocational schools in the community. Subsequently, all training activities were conducted inside the plant.

With 400 workers at the outset (January 1944), plant employment gradually increased to 2,300 in April 1945.

Personal and Family Characteristics

Personal characteristics.—Manpower shortage, the Selective Service Act, and certain features of the Twin Cities' labor market were mirrored in the new work force.

War-induced shortages of men opened up new opportunities for women. Of the 248 workers studied, 49 or close to a fifth were women. This was in sharp contrast to the prewar situation in metalworking plants. Even as late as the Pearl Harbor attack, less than 4 percent of the employees in propeller production were women.

The effect of the draft was apparent in the relatively small proportion of younger men employed in the plant. Little more than a fifth of the male propeller workers were from 25 to 34 years of age, as compared with a similar age group of almost a third of St. Paul male workers in manufacturing work in 1940. Seven of the men were 60 years of age or older, four of them were 65 or over. Among the older men in the propeller plant, as in many other war industries, were a number brought out of retirement by the war.

The women, on the average, were considerably younger than the men. More than two out of five were less than 25 years old. Younger women, of course, were the least likely to have family responsibilities and were, therefore, the group most readily available.

Relatively few Negro workers were employed. In 1940 Negroes formed about 1 percent of the population of St. Paul. Slightly more than this proportion was found in the sample. There was no evidence of discrimination.

The educational level of the workers was relatively high. More than half (157) had some high-school education and 15 percent had 1 or more years of college training. Only 5 had less than 5 years of grammar school.

Peacetime physical standards were modified. The company employed a high proportion of disabled workers; 42 (17 percent of the total) reported physical disabilities. Defective and injured legs or leg joints were among the most frequently mentioned, but did not prevent workers from holding jobs as inspector, welding-die repairman, janitor, hot-form helper, grinder, die setter, hammerman, crane hooker, furnace loader, and foreman.

The propeller plant had on its pay rolls a fairly large number of World War II veterans; among those surveyed were 22, or almost 10 percent of the sample. Eleven of the 22 reported disabilities, ranging from "nervous condition" to gunshot wounds.

Family characteristics.—Almost three-fourths of the workers (182) were heads of families. An additional 21 had no family attachments, while 45 lived in family groups of which they were not the head. Only 13 men were in the last group. More than a third of the women were either heads of families or living alone and supporting themselves.

The majority of the workers not only were members of families but were also supporting families. Only 71 were without dependents. Sixty-five of the men were supporting three or more dependents each, and in 13 instances the worker had five or more dependents. In a number of cases, the workers surveyed were the sole wage earners of large families completely dependent on their income from war jobs.

The average number of persons employed per family was moderately larger in the group surveyed than was typical of St. Paul in 1940. However, the employment status of the families of the propeller workers does not coincide with the popular belief that most war workers' families had several persons working. In fact, there were only 38 cases (15 percent) [2] in which two or more family members were employed in addition to the worker surveyed; in some instances all employed members of the family were engaged in war jobs subject to termination with the cessation of war production.

Industrial and Occupational Background

War production brought a new work force to the Twin Cities and great changes into the working lives of those already there.

All but 49 of the St. Paul propeller workers had worked for at least three employers since the beginning of 1941. The largest single group of the men, 59 in number, consisted of workers who had had four different employers since 1941. Two had worked for as many as nine different employers in the space of little over 4 years. Only 35 percent of the women, compared to 62 percent of the men, had four or more employers during this period. The lower turn-over among women was due largely to the late entry of many women into the labor market.

Workers changed jobs more frequently than they changed employers. Changing products and processes, plus high turn-over rates, made it necessary even within plants to shift workers into new jobs. These factors explain to a considerable degree why all but 37 of the workers had held three or more different jobs since the beginning of 1941.

Industry changes.—Only 67 (27 percent) of the 248 workers had usually worked in manufacturing industries. Of the remainder, 44

[2] There is some duplication in this figure since, in several cases, two or more workers belonging to the same family were surveyed.

were drawn from wholesale and retail trade, 25 from the service trades, 24 from construction, 21 from farming, and 17 from transportation, communication, and other public utilities. Smaller numbers were employed at the beginning of the war in mining, finance, insurance and real estate, and government.

The industries which many of the workers left offered a degree of security which the propeller plant could not match. It was fairly well known in the community that the plant lease called for the removal of facilities within 6 months after the cessation of hostilities. There were, of course, workers who had no security to lose and still others who could be reasonably sure of returning to their prewar occupations or businesses when their war jobs ended. Some were attracted by high wages. Others patriotically sacrificed income to help in the war effort. Some sought war jobs because wartime manpower and materials restrictions made impossible the conduct of their normal activities. Others entered war work under the urging of their draft boards. In short, the motivations that led workers into the propeller plant ran the gamut of wartime pulls and pressures.

Occupational changes.—Of the 248 propeller workers studied, 226 were employed as craftsmen and manual workers at the time of the survey. Only 117, or little less than half, had normally been so engaged in peacetime. Fifteen of the remaining 131 were usually professionals or semiprofessionals, 23 were proprietors, managers, and officials, 18 were farmers or farm laborers, 51 were in clerical, sales, or kindred work, 15 were service workers, and 9 were housewives.

Ralph A., for 16 years a teacher and high-school principal, exemplifies the professional who entered the factory during the war. Motivated by the inadequacy of his earnings as high-school principal in a small community, he improved his financial position substantially by the change and expressed a hope to continue in his war job. His background, in all likelihood, played some role in his selection for the position of time-study observer at the propeller plant.[3]

Farmers who entered war industry were also frequently induced to do so by the high wages offered as compared with their earnings on the land.

This appears to be the force that drew Harold E., 35 years old, who invested $140 in an aircraft metalworking course in order to prepare himself for a war job. Required by his draft board to return to farm work at harvest time, he shuttled between California war plants and Minnesota farms twice before taking a job in the propeller plant. Though glad of the chance to earn high factory wages while they were available, Mr. E. foresaw hard times coming and thought he would be better off back on the farm when his war job ended.

Occupational changes of craftsmen and manual workers.—The experience of the St. Paul propeller workers seems in conflict with the popular notion of universal and rapid wartime upgrading. Among those who had employment experience before 1941, it appears that 47 were normally skilled workers or foremen. At the time of this study, however, only 24 of them were employed in skilled occupations. Of the remaining 23, there were 14 in semiskilled jobs and 9 in unskilled occupations.

The downgrading process cannot be explained by lack of skilled jobs. The majority of skilled jobs were filled, not by former skilled craftsmen, but by workers who were previously semiskilled workers, proprietors, managers and officials, or clerks. Of 21 men who were previously proprietors, managers and officials, 10 were employed as

[3] All names of individuals used in this report are fictitious.

skilled workmen and 11 in semiskilled jobs. The 31 men who were clerical, sales, or kindred workers before the war seem to have done almost as well, with 11 holding skilled and 12 semiskilled jobs. None of the 7 men who were unskilled laborers before the war was engaged in a skilled job, though 4 of them had been upgraded to the semiskilled category.

There appears to be no single explanation which would account for the acceptance of semiskilled and unskilled jobs by those who were normally skilled workers. Some apparently found that they could earn more by accepting less-skilled jobs in a war plant, while others (including a number of the peacetime construction workers) found the market for their skills too limited as the war neared its end. Still others, voluntarily or under draft-board pressure, chose less-skilled essential work in preference to skilled but nonessential activity.

None of the 49 women held a skilled job. Neither lack of experience nor lack of openings satisfactorily accounts for this fact.

Training.—Most of the propeller workers' wartime occupational changes were accomplished without formal training or retraining.[4] Of 69 workers surveyed who held skilled jobs, only 33 had received either prewar or wartime training even remotely related to the work they performed in the propeller plant.

Upgrading of untrained workers to skilled jobs was a common wartime phenomenon. The process was greatly facilitated, of course, by the fact that the jobs themselves were frequently "diluted" in content.

Only 28 in all reported serving an apprenticeship before January 1941. Another 23 reported having attended trade or vocational school before 1941—15 for less than 2 years and 8 for 2 years or more.

Of the total of 51 who reported formal prewar training, only about three-fifths were trained in metalworking skills or in occupations (such as electrician) which might be considered related to metalworking. Their training apparently exerted some but not a determining influence on the kinds of jobs held in the propeller plant. Of 32 trained before the war in metalworking or related skills, 17 or little more than half held skilled jobs. Not all of these jobs, however, were related to the type of training which the worker had received. One man, for example, who had served a year as "apprentice" in telephone wire and cable work was employed as an engine-lathe operator. Of the remaining 15 with metalwork or related training, 9 held semiskilled and 6 unskilled jobs in the propeller plant. One man, who had served a 4-year apprenticeship as a boilermaker, was employed as a rough grinder—an unskilled occupation.

Nineteen reported prewar training in a variety of nonmetalworking occupations—6 held skilled jobs in the propeller plant, 9 held semiskilled jobs, and the remaining 4 were divided evenly between service and clerical work. Their prewar training had been in the building trades, the printing trades, and such varied occupations as candy dipping, barbering, men's tailoring, ladies' dressmaking, and baking.

After January 1941, training was frequently started with specific jobs in view. It is therefore not surprising to find that 21 of 35 workers who obtained vocational training of 1 month's duration or more after 1940 held propeller-plant jobs in which they made greater or less use of the skills they acquired through such training.

[4] Throughout this section only training of 1 month or more is considered. A number of workers reported trade or vocational school training, ranging in duration from 1 day to 3 weeks.

Migration of Workers

At one time or another since the beginning of 1941 one out of three workers surveyed moved from one community to another to take or to seek new work.[5] They moved from farms to cities, from light-industry communities to new and expanding centers of heavy industry.

In all, the 73 workers who reported migrations connected with job changes moved a total of 136 [6] times, an average of close to two moves per person. Among these migrants, single persons without dependents (one-person families) were the most mobile group. Of the 21 single persons, 10 made at least one migration and 5 moved twice. Only 53, less than a third, of the family heads had moved from one community to another since 1940.

TABLE 1.—*Characteristics of St. Paul Propeller-Plant Workers Who Migrated*

Characteristics of workers	Total workers	Workers moving from one city to another after 1940	
		Number	Percent
Total workers	248	73	29
Sex:			
Male	199	65	33
Female	49	8	16
Color:			
White	243	70	29
Negro	5	3	60
Age: [1]			
Under 20 years	8	2	25
20–44 years	165	52	32
45 years and over	75	19	25
Marital status: [1]			
Single	49	21	43
Married	182	45	25
Other	17	7	41
Family head: [1]			
1-person families	21	10	48
Other family head	182	53	29
Not head of family	45	10	22
Size of family: [1]			
1-person families	21	10	48
2-person families	52	15	29
3–5-person families	145	41	28
6–8-person families	29	7	24
9 or more person families	1	-------	-------

[1] As of time of survey.

Least mobile were those who were members but not the heads of multiperson families; most of them were women. Only 8 of the 49 women, less than a sixth, had moved from one city to another since 1940, while the proportion of men who did so was twice as great.

Family size seems to have exerted little if any influence on the mobility of the workers surveyed. The age factor shows a somewhat more significant correlation with mobility. Almost a third of the workers from 20 to 44 years of age changed communities at least once, as compared with slightly more than a quarter of those 45 years and over. The lesser mobility of the older workers is probably associated with greater family attachments and responsibilities.

More than 1 out of 5 of the propeller workers were not living in St. Paul at the beginning of 1941. Two were more than a thousand miles away (1 in Mississippi and another in Pennsylvania), 6 had homes in Illinois, Michigan and Indiana, and another 9 lived in States bordering on Minnesota, namely North Dakota, South Dakota, Iowa, and Wisconsin. The remaining 34 who migrated to St. Paul

[5] Migrations not connected directly with changes in jobs, e. g., a move made by a worker because someone else in his family found a new job elsewhere, are not considered except where otherwise noted.

[6] Excluding moves within the same community.

were, at that time, living in communities scattered throughout the State of Minnesota.

Certain others were living in St. Paul in January 1941, but subsequently left to take jobs elsewhere, in several cases at great distances from their homes—Alaska (highway construction), California (shipbuilding, aircraft, oil, and construction), Washington, Canada, Florida, Oregon, and Arizona. Several of the women traveled in the wake of husbands who were shifted from camp to camp by the armed forces. At the time of the survey, 30 workers were more than 100 miles from where they had lived early in 1941.

Although migrations were generally short, they were frequently costly. Of 92 moves for which the cost was reported, 19 (more than a fifth) involved outlays of $100 or more. These outlays were in addition to loss of earnings during the time required to move. Two workers reported moves costing $500, and another 6 spent from $200 to $500 on individual moves. Moving expenses, of course, tended to run highest among heads of families, though 4 of the single workers stated that moving from one job location to another had cost them between $75 and $100.

The longest migrations were not necessarily the most costly. A worker from western Pennsylvania spent only $50 to move to St. Paul; his wife and three children were left behind. A worker who lived in Mississippi at the beginning of 1941 shared a ride to Chicago with several others, at a cost of $12.50; he also left his family behind. One man spent $200 each way, moving his wife, two children, and his father-in-law from Minneapolis to Chicago and back. One four-person family spent $500 moving from Kalamazoo, Mich., to St. Paul.

Expenses as large as those described are not lightly undertaken. The element of risk was reduced considerably during wartime because of the availability of jobs. Return to a more normal labor market, however, will doubtless immobilize many who do not feel free to gamble their savings on moving. Geographical mobility of labor, however, is generally recognized as a necessary condition for full employment.[1]

Outlays for moving were not in all cases offset by immediate increases in income. In 89 cases the workers earned more on the first job obtained after the move than they had earned before, 3 migrations resulted in no change in earnings, and 35 migrations were followed by decreases in weekly earnings. Some who received reduced earnings after moving may have had expectations of higher incomes which failed to materialize. A few moved because their previous jobs had ended and there was no work immediately available where they lived. These probably were inclined to take what they could get after moving. Others may have accepted jobs at relatively low beginning rates in hope of subsequent upgrading. Still others may have been influenced by their draft boards.

The wartime travels of Clarence L., though somewhat unusual in their frequency, are illustrative of the variety of reasons which led workers to move from place to place.

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[1] Sir William Beveridge, in his Full Employment in a Free Society (New York, W. W. Norton & Co., 1945) lists the "organized mobility of labor" as one of three necessary conditions for full employment. A statistical demonstration of the importance of labor mobility for full employment in the United States is presented in Internal Migration and Full Employment in the United States, by A. J. Jaffe and Seymour L. Wolfbein, in the Journal of the American Statistical Association, September 1945.

Mr. L., a Negro worker, left his home in South Bend, Ind., for undisclosed "personal" reasons and moved to Chicago. After the completion of a construction contract on which he was engaged in the latter city, he returned to South Bend. Subsequently, the high wages paid welders in Michigan attracted him to the town of Buchanan. Fear that his health was being affected by welding and a desire for outdoor work next led him to Detroit. The unavailability of housing for Negroes in that city caused him to leave after 2 months. Then, hearing of openings in the propeller plant, he moved on to St. Paul.

Unionization Among Propeller-Plant Workers

Union membership was among the new experiences which the war brought. Sixty-nine of the 103 propeller workers who held union cards at the time of the survey had never been union members before 1941.

Locals of five American Federation of Labor affiliates had collective-bargaining agreements at the propeller plant,[8] with maintenance-of-membership provisions. Workers were free to join or not to join the unions covering their respective occupations; but, once in, they were required to remain members.

Propeller workers who joined unions varied widely with respect to previous occupational experience. Proportionately, the largest number who joined were normally employed in skilled and semiskilled occupations; the smallest number were professionals and semiprofessionals, unskilled workers, and those normally engaged in clerical, sales and kindred occupations.

Almost half of the men (92 of 199) belonged to unions; about one out of four women (11 of 49) held cards.

TABLE 2.—*Union Membership Among 248 St. Paul Propeller-Plant Workers in Spring of 1945, by Usual Occupational Group*

Usual occupational group	All workers	Union members	
		Number	Percent
All groups	248	103	42
Professional and semiprofessional	15	2	13
Proprietors, managers, and officials	23	9	39
Farmers and farm laborers	18	8	44
Clerical, sales, and kindred workers	51	16	31
Service workers [1]	15	5	33
Craftsmen and manual workers:			
Skilled [2]	51	30	59
Semiskilled	55	29	53
Unskilled	11	1	9
Housewives	9	3	33

[1] Includes protective, domestic, and personal service workers; also building-service workers and porters, as well as those engaged in service industries.
[2] Includes foremen.

Earlier experience in labor organizations seems to have influenced somewhat, though not decisively, the extent to which workers joined unions. Of 73 workers who had been union members at some time prior to 1941, there were 34 (47 percent) who joined one of the five locals covering the plant. On the other hand, only 69 of 174 (40 percent) of those who had no prewar experience in unions were members at the time of the survey.

[8] International Association of Machinists; International Brotherhood of Blacksmiths, Drop Forgers and Helpers; International Brotherhood of Teamsters, Chauffeurs, Warehousemen and Helpers; International Brotherhood of Firemen and Oilers; and International Union of Operating Engineers.

Wartime Earnings

Considered as a group, the St. Paul propeller-plant workers shared in the general upward movement of wages that resulted from long hours, shift differentials, incentive payments, and the movement of workers from low- to high-wage industries during the war period. At the time of the survey half the men earned more and half less than $1.25 per hour.[9] The corresponding median for the women workers was 89 cents, and for the entire group, $1.18.

For most of the workers hourly earnings in the propeller plant were considerably above those received during the year preceding the attack on Pearl Harbor. In all, 189 workers (172 men and 17 women), reported 1941 hourly earnings for comparison with their earnings at the time of the survey. Nine workers had increased their earnings by less than 10 percent during the period under consideration, 22 had gains of 10 to 24 percent and an equal number had increases of 25 to 49 percent and of 50 to 74 percent. Increases of 75 to 99 percent were reported by 29 workers; and 61, almost a third of those reporting earnings changes, enjoyed gains of 100 percent or more.

In many instances, a large percentage rise reflected an increase from a very low prewar level, and brought the worker only to the bottom ranks of wartime wage levels.

Not all of the workers were able to increase their hourly rates during the war. Almost one out of eight of the men, 22 to be exact, actually earned less per hour at the time of the survey than during 1941. Reductions of earnings seem to have fallen most heavily on those who had the highest prewar earnings. Of 14 men who had earned $1.50 or more per hour during 1941, all but 5 earned less than that amount in the propeller plant, 3 of them receiving less than $1.

Weekly earnings were substantially higher than in 1941. Comparisons with earnings during that year were possible in the case of 189 workers. Close to three out of five, 112 in all, had increased their earnings by 75 percent or more since 1941. Increases of 150 percent or more were reported by 57 workers. On the other hand, there were 19 who reported decreases and another 19 whose earnings had increased by less than 25 percent.

Long hours, with premium overtime rates paid after 8 hours per day, plus shift differentials received by some of the workers, determined the level of weekly earnings. The dividing line between the lowest-paid half of the workers and the highest-paid half was $72.50 for men, $44.81 for women and $65.77 for the entire group. Hours of work per week were 48 or more for all workers surveyed. Seven out of ten, 174 in all, worked 48 hours; 69 (including 2 women) regularly worked more than 52 hours.

Average gross weekly earnings of the entire group of 248 workers were $68.50 at the time of the survey.[10] From this, an average of $9.08 was deducted for income taxes and an additional $0.68 for social security taxes, leaving $58.74. Since pay-roll deductions for war bonds amounted to approximately 10 percent of the total plant pay roll, the workers surveyed may be assumed to have contributed an

[9] The entire discussion of hourly earnings is in terms of straight-time earnings. Overtime premium pay and shift differentials are excluded.

[10] This is somewhat higher than the average for the airplane-propeller industry as a whole. As of April 1945, workers employed by prime contractors making propellers for the various procurement agencies earned an average of $62.51 per week. Average hours worked were 46.7 per week, making average hourly earnings (including overtime) $1.34. It is estimated that straight-time hourly earnings were $1.24.

average of $6.85 per week for that purpose. This would put "take home" pay at $51.89. After adjustment of this figure for a living-cost rise of roughly 30 percent, the average propeller worker had spendable earnings equivalent to less than $40 per week in terms of early 1941 purchasing power. If no deductions are made for war bonds, the comparable deflated figure for spendable weekly earnings in 1941 prices would be $45.18.

For most industrial employees, the war years meant far steadier work than they had enjoyed in normal times. This is reflected in the levels of the annual earnings of the propeller workers. During 1944, half of the 241 for whom data are available had an annual wage income of less than $2,481 and half earned more than that amount. The dividing line between the lowest- and highest-paid halves of the male group was $2,769. The dividing line for the women was considerably lower, $1,365. The very marked difference between the annual earnings of the men and those of the women is attributable in large part to the fact that a number of women were not employed throughout the year, having entered or reentered the labor market at various times during 1944. The differences in the wage rates received by men and women, respectively, contributed, of course, to the annual earnings differential.

Few of the propeller workers were in the higher income brackets. Only 6 of the 196 men who reported total 1944 wages earned $5,000 or more. Of the 45 women for whom 1944 wage income is available, none had gross earnings of as much as $2,500 for the year and all but 8 earned less than $2,000; earnings of 26 (more than half) were under $1,500. The lowest earners, however, include some who were not at work throughout the entire year.

Postwar Plans [11]

In the course of the survey, the workers had been asked whether they wanted to remain in the jobs they then held, whether they expected to do so and, if not, what changes they planned and why.

There was small hope that they would be able to continue in the propeller plant, which closed on August 22, 1945. The lease called for removal of the operation within 6 months after cessation of hostilities. Throughout its active life the plant made only one product—hollow-steel aircraft propellers, not a part of the company's business before the war. Company plans for postwar production were far from certain.

If the plant's future had been put up to the workers there is no doubt what the decision would have been. Three-fifths of them, all but 96 of those who planned to continue working, wanted to keep their jobs. Evidently hoping that they would be able to continue at the plant, 71 men and 17 women had made no plans to do anything else after the war ended. Many of the others "wanted" and "expected" to continue in their jobs, but indicated what they "might" do if and when laid off or discharged.

Occupational changes.—Of the men, 128 or close to two-thirds had ideas on postwar employment. Slightly more than half, 68, expected to return to their usual occupations or to occupations similar to those in which they were usually engaged. The proportions expecting to

[11] Follow-up studies will trace the actual situation of these workers after leaving the propeller plant.

revert to their normal occupational status were largest among those usually engaged in professional, managerial, and white-collar occupations. Nine of 11 professionals and semiprofessionals with postwar plans expected to resume their previous type of work, as did also 12 of the 15 who had been proprietors, managers, and officials, and 15 of the 24 white-collar employees (clerical, sales and kindred workers). Six out of the remaining 9 in the last group hoped to become proprietors, managers, or officials.

Men in the craftsman and manual-worker group showed the greatest divergence between usual occupation and postwar intentions. Only 19 of 36 skilled workers with plans for the future expected to engage in skilled labor after the war. Eight expected to start their own business, and 1, rather surprisingly, was headed for semiskilled work. Semiskilled workers indicated a wider diversity of plans than any other group. Of 21 who had some idea what they would do when the war ended, only 3 expected to return to semiskilled jobs, 5 expected to establish businesses, 1 to become a farmer, 2 to become white-collar workers, 1 to become a service worker, 2 to become skilled workers, 1 to get an unskilled job, and 1 to leave the labor market.

Only 6 out of 11 men who were normally engaged in farming planned to return to rural life after the war. One intended to establish a business, another to get a white-collar job, a third to become a semiskilled worker, and the remaining two to find skilled jobs.

The men who were usually employed in semiskilled and unskilled work were the only groups in which a majority gave no indications of future plans for employment. Of 46 semiskilled workers, 25 had no plans except to remain where they were if they could. The same was true of 4 of the 7 unskilled workers.

Among the women who had ideas as to what they would do in the future, a surprisingly large proportion (21 out of 32) indicated intentions to retire from the labor market. Most of these expected to return to housekeeping responsibilities which they left for war jobs, but several of the younger women wanted to return to school. Their plans, however, may not be typical of the postwar plans of women war workers. It should be recalled at this point that most of the women propeller workers were among the last to enter the labor market during the war period, and would probably be among the first to leave.

There are indications, nevertheless, from the survey of the propeller workers that more women will remain in the labor market after the war than were gainfully occupied before it began. As of January 1941, only 10 out of 49 women surveyed were employed and none of the others was actively seeking work. Of 32 who reported their postwar plans, 11 proposed to continue working. Some of the remaining 17 who reported no plans may also seek other jobs. Additionally, some of the 21 who expect to leave the labor market may well find it necessary to alter their plans if the chief breadwinners of their families are unable to find work or are forced to accept jobs paying inadequate wages.

Industrial changes.—The service industries and trade loom large in the postwar plans of the propeller workers as a group. Of 96 who reported postwar plans in sufficient detail to permit classification by industry, wholesale and retail trade is the field in which 28 planned to work if and when their war jobs ended. Another 21 proposed to enter

service industries, and 19 said they were going into the construction industry, a field from which most of them came. Only 11 intended to remain in manufacturing and, of these, 4 planned to work in the food industry.

Failure to report postwar plans was disproportionately large among those usually engaged in semiskilled and unskilled occupations. This undoubtedly contributed to the small proportion of those proposing to continue in manufacturing industry.

Plans for migration.—The migration plans reported at the time of the interview were often far from definite. In many cases, moving out of St. Paul was contemplated only if there was no possibility of remaining in the propeller plant. In that event, almost one out of three of the workers surveyed, 76 in all, expressed an intention to leave St. Paul.

The destinations of 62 lay elsewhere within the State of Minnesota. Another 5 were not specific, but indicated that they would leave St. Paul. Of the remaining 9, two expected to go to California, 1 to Florida, and another to some unspecified place on the Pacific Coast. Colorado, Montana, and Oklahoma, respectively, attracted 3 workers, and 2 others said they were going to Wisconsin.

About half of those who had migrated since 1940 planned further moves after the war ended.[12] Omitting those workers who had first left and then returned to St. Paul, little more than half of the wartime migrants expected to return to where they had lived at the beginning of 1941. The remainder had severed connections with their previous homes.

[12] This does not necessarily mean that all the other wartime migrants proposed to remain in St. Paul. Some did not report postwar plans.

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Wartime Labor Force of Houston Ordnance Plant[1]

Summary

A SERIES of studies was made by the Bureau of Labor Statistics in the spring of 1945, to provide factual information useful in the solution of some of the industrial problems emerging from reconversion to peacetime production.[2] The study reported upon here included 250 employees of the Dickson Gun Plant at Houston. The employee group contained 183 men and 67 women, of whom 50 men and 17 women were Negroes. The 17 Negro women constituted the whole group of their sex and color employed in the plant at the time of the study;[3] with that exception, the workers chosen for study were carefully selected so as to be representative of the entire work force.

A moderately high level of academic education was reported by the group; few had had vocational training. Forty percent had come from outside the city of Houston to take a war job, a few from more than 1,000 miles away. Over a third of these migrants had come from rural areas.

Although three-fourths had been gainfully employed before the war, most of them had been in industries more or less remote from gun production, and 12 percent had been on farms. At the time of the Bureau's study, in April 1945, 88 percent of the group were craftsmen and manual workers—half classed as skilled and one-fourth each as semiskilled and unskilled. Hours were long, ranging from 60 to 70 per week, but employee comments expressed fatigue rather than dissatisfaction.

For the 250 employees studied, straight-time earnings averaged $1.009 per hour, excluding premium overtime pay. The men's average was $1.04 and that of the women 92.2 cents. Gross weekly earnings averaged $75.92; net earnings after deduction of income and social-security taxes and union dues averaged $64.76.

Nearly three-fourths of the workers wished to remain in their April 1945 occupations after the war, but some of these did not actually expect that this would be possible. Less than two-thirds of the white men who did not expect to remain were planning to return to their prewar pursuits, however, and almost half of the white women expected to leave the labor market altogether.

Follow-up studies of these 250 workers are to be made periodically, to determine changes in their economic situation brought about by the transition from military to civilian production.

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[1] Prepared in the Bureau's Wage Analysis Branch by Walter T. Watson with the assistance of Elaine V. Doane.

[2] For similar reports on the workers of the Willow Run bomber plant and of a St. Paul aircraft-parts plant, see Monthly Labor Review for December 1945 and January 1946.

[3] Negro women were deliberately overrepresented, with a view to obtaining from this and other study units a group large enough to provide illustrative material on the special problems of such workers.

The Ordnance Plant at Houston

This establishment from which workers were selected for study was officially designated as "Dickson Gun Plant, an ordnance-owned plant operated by the Hughes Tool Co. on a cost plus a fixed fee basis producing finished machined 8-inch howitzer cannon and centrifugally cast, rough-machined and heat-treated medium-sized artillery." The Hughes Tool Co., long a recognized manufacturer of oil-field tools and equipment, operated both the gun establishment and an aircraft-strut plant producing struts and shell cases. The total employment of all Hughes units approximated 8,990 in January 1945.

Army ordnance officials estimated that $18,333,300 was expended in the purchase of the gun site and for construction and equipment.

Production at the gun plant began February 8, 1943, and peak employment (2,200 persons, including office and supervisory staff) was reached in March 1945. In addition to howitzers, gun barrels or tubes ranging in size from 37 mm. to 105 mm. were manufactured.

Rapidly changing war needs marked the short history of the plant. On February 3, 1944, one year after the first gun barrel was cast, the Army Ordnance Department announced that the Dickson plant would close on March 31, 1944, since the needs of the Army had been met.[4]

On March 15, 1944, however, the officials indicated that gun manufacture would be continued for at least 6 months longer. The sudden change in plans was attributed to the fact that the output of the Houston plant was exceptionally high and the unit cost of production among the lowest in the country. In May 1945, the processing of light guns was reduced and emphasis was placed on the manufacture of heavy howitzers. The following month announcement was made that the plant would close by August 31, 1945, but would be maintained in a stand-by condition. The Hughes Tool Co., according to press reports, would absorb 500 of the displaced workers in its other units. Finally, on August 13, one day before VJ-day, all Dickson employees were advised that the War Department had directed the immediate stoppage of all work. All "interested" hourly paid employees were offered transfers to other Hughes plants.

Personal and Family Characteristics of Workers

AGE AND PHYSICAL CONDITION

Approximately 80 percent of the 250 workers interviewed were 20 to 45 years of age, about 15 percent were between 45 and 64, and the remaining 5 percent were under 20 years.

The age range of men and women differed markedly. There were no women over 45, and more than half were under 30. Among the males there were boys as young as 16 and gray-haired grandfathers as old as 64. Although the majority of the men (three-fifths) were between 30 and 45, a fifth were 45 years of age and over, and the remaining fifth were under 30. Age groups for Negro workers corresponded closely to those for the entire sample.

[4] See Houston Chronicle, especially the February 4, March 15, and June 1, 1945, issues, for some of the events cited in this section

One-fifth of the men interviewed reported physical disabilities. The shortage of personnel and the pressure to meet production quotas made it mandatory for plant officials to devise methods to utilize men handicapped by loss of limb, loss of an eye, defective hearing, and the more generalized disabilities such as arthritis, lung trouble, spine trouble, heart ailments, and sinus infections. Often these workers were relieved of arduous tasks or transferred to positions which required less physical strain. A few were granted intermittent leaves of absence when deemed advisable from a health standpoint.[5]

VETERAN STATUS

Twenty-four, or 13 percent, of the men had served during World War II, most of them in the Army. These men, seemingly, had adjusted themselves satisfactorily to civilian life and felt, on the whole, that their labor at the gun plant was essential and "next to being in the Army." None of the women had been in the armed services prior to employment at Dickson.

FAMILY RESPONSIBILITIES

Seventy-seven percent of all employees interviewed (85 percent of all the men and 57 percent of all the women) were married. Single workers (1 of every 3 women compared with 1 of every 8 men) constituted nearly a fifth of the total group studied. More women (9 percent) than men (2 percent) were divorced, separated, or widowed. Among the men more Negroes than whites, but among the women fewer Negroes than whites, were married. Fewer Negro than white women were single; more were divorced.

Three-fourths of all employees studied (including 1-person families or unattached workers) were heads of families; 90 percent of the men but only 38 percent of the women were family heads, and 163 of 170 men but only 17 of 26 women who were family heads reported families with 2 or more members.

The reasons for the women's familial responsibilities varied; some had husbands in service or in ill health, and a few women were widows. The desire to lead an independent life away from home and their family was paramount among the heads of some 1-person families, usually the younger women. Employment at the gun plant made this desire a reality. Still other women had long wanted to earn money of their own but had been untrained for any particular line of endeavor, and, again, work at the gun factory was the answer.[6]

Family composition and dependency.—Of the 203 workers who were or had been married, 147 (73 percent) were parents of children under 15 years of age. In all there were 282 children in this age group—40 percent under 5 years, 25 percent between 5 and 9 years, and 35 percent between 10 and 15 years.

Workers' families often included parents, parents-in-law, or other relatives. About 203 such individuals were reported, an average of eight-tenths person per family. Three-fourths of the workers be-

[5] The company provided a first-aid room with a first-aid man and nurse in attendance. Under the general supervision of a doctor, this facility was intended to give medical attention in emergencies to all employees.

[6] Despite these more-practical motivating reasons, almost every woman and most of the men told the Bureau's representatives that it was an honor to work at a war plant.

longed to households of 3 or more members. Four-person families were found most frequently, followed in turn by domestic units of 3 and 5, respectively. The average size was 3.7. This compares roughly with a 3.8 average for Texas in 1940.

Including all persons receiving support, whether or not related and whether or not living in the same dwelling or locality, the male workers visited had dependents ranging in number from 0 to 8; less than a tenth claimed no dependents of any sort, two-fifths reported 1 or 2 dependents, and one-third reported 3. Dependents of female employees ranged from 0 to 4; half had no dependents, two-fifths reported 1 or 2, and the rest either 3 or 4.

Home conditions.—The interviewers, visiting the Dickson employees in their homes, observed that their children seemed to be "average" American children. What was frequently lacking was a home atmosphere appropriate to growing citizens. In many cases the living arrangements were makeshift crowded apartments in dilapidated rooming houses; tenement courts, dark and barren in appearance; defense housing projects where the space between families was no more than the breadth of a wall; trailer camps, with community baths, where families were forced to live in the open because of lack of room inside the trailer. These and similar living accommodations were often inadequate to meet properly the needs of adults, much less the requirements for the physical and social health of children.

On the other hand, many families had comfortable modern residences in somewhat better sections of the city. The interviewer in approaching a home of this kind could safely assume that it housed permanent residents of the community, the family head being, likely as not, a former employee of the Hughes Tool Co. or some other Houston establishment.

Many of the Negroes lived in small houses in a district near the plant. These homes were usually neatly furnished and neatly kept. Other Negro workers were not so fortunately situated.

Workers who came to Houston after the war started found the shortage of residences a particularly serious problem. Often it was necessary to share a dwelling and equipment with other families. Under such conditions, distances to and from the plant were necessarily excluded from consideration. Workers spoke of riding 3 busses each way. For the unmarried or war-separated workers, the housing problem was somewhat less difficult. A few of these lodged in boarding houses, apartment houses, and lower-priced hotels; others moved in with friends or relatives.

EDUCATION AND TRAINING

Academic education.—High-school attendance of from 1 to 4 years was reported by 68 percent of the 250 employees; half of this group continued for the full 4 years. College enrollment of a year or more was reported by 6 percent. About 1 out of every 3 employees claimed grade-school education only.

The formal educational attainment of the men was inferior to that of the women; a third of the former but only an eighth of the latter failed to reach high school. Of the 12 workers who were under 21 years

of age, none had registered for college, and 4 did not attend high school.

Negro men reported comparatively little formal education. Two-fifths managed to remain in high school 1 to 4 years (only 2 graduated). Twelve Negro men did not go beyond the fifth grade; one had spent less than a month in school. Negro women were better educated; their schooling compared favorably with that received by the entire group of workers. All but one had attended high school and all but two of these continued for the full 4 years. Three Negro women had attended college for periods varying from 1 to 2½ years.

The Bureau's interviewers reported that employees with relatively little education frequently demonstrated unusual capacity to acquire knowledge and skills. For example, work records showed that among the workers who had only 7 years in school, one held an administrative position which required an understanding of mathematics and chemistry, in addition to an ability to act in a supervisory capacity over men; another occupied a responsible place as a working foreman.

Formal vocational training.—No more than 16 percent of the entire group of workers had obtained formal training in trade or vocational schools, either before or after January 1941. Prior to 1941 such education was limited to mathematics and chemistry for men, and to secretarial, beauty, and nurses' training courses for women. After January 1941, the number of women receiving formal training increased, preparation for metalworking taking precedence over other subjects. This training, of a month or more, was usually obtained on the job, at part-time classes held at Dickson under the supervision of experienced personnel, and it was generally designed to assist workers entering a metalworking industry for the first time.

A few employees, both men and women, had served apprenticeships at the Hughes Co. main plant in such specialized tasks as machine tooling and instrument use. Some of these trainees, in turn, became instructors in gun manufacturing. One man devoted 1 year at night to the study of shop-practice problems in mechanical drawing. A few of the workers had been sent to gun plants in the North for special training in particular phases of gun production.

Prewar Background of Workers

Workers' migrations.—Of the 250 workers studied, 97 (or 40 percent) were recruited from the migrants[7] who came into the Houston area in search of war work and war wages. To indicate the nature and extent of their migrations, estimates were made of the distances between 80 workers' residences in January 1941 and places of employment in April 1945. Of the 80 men and women who were not residents of Houston in 1941, 22 were then living within a radius of 100 miles, 43 within a distance of 100 to 500 miles, 5 in localities 500 to 1,000 miles away, and 7 at distances greater than 1,000 miles. The other 3 did not report their addresses in 1941.

Included among the 97 migrants were half (23 of 47) of all single workers, a little more than a third (70 of 193) of all who were married, and 4 of the 10 workers who were separated, divorced, or widowed.

[7] In this study the term "migrant" is used to designate persons who moved from one locality or city to another to take or seek work, between January 1941 and April 1945.

Relatively more workers over than under 20 years of age migrated, and more men than women (41 percent compared to 34 percent). Migrant whites and Negroes were found in the sample in about equal proportions.

Family size apparently did not deter migration. About two-fifths of all workers with 2 or more persons in their families (including 18 of 34 families with 6 to 8 members and 2 families with 9 or more) migrated.

Three-fourths of the 97 workers who came to Houston from elsewhere reported only 1 move between January 1941 and April 1945, a fifth reported 2 or 3 moves, and the remainder 4 or 5. Altogether, 151 intercity migrations were made by the 97 migrant employees, nine-tenths of whom were heads of families with 2 or more members. The average cost per move was $57. While 99 were estimated as costing less than $50 each, the remainder varied from $50 to $500. The majority of moves reported by single individuals, or by 1-person families, were estimated as costing under $75, a few from $100 to $300.

Gross weekly earnings increased immediately following migration in about three-fifths of the moves, decreased in somewhat over a fourth, and were unchanged in the remaining cases.

Prewar residence.—Nine out of 10 who were interviewed were residing in Texas in January 1941. Half of the remainder were living in the Southern States of Louisiana, Arkansas, Mississippi, Tennessee, and Kentucky. The others (about 5 percent) were widely scattered over the country, from the Pacific to the Atlantic seaboard and from the Canadian border to Mexico.

When the towns and cities in which the 250 Dickson employees lived at the beginning of 1941 are considered from the standpoint of size, it appears that Houston, with a population of 384,000, claimed 67 percent; other cities of 250,000 or more, an additional 4 percent. In communities of 100,000 to 250,000, of 10,000 to 100,000, and of less than 10,000, the percentages were respectively, 1, 4, and 24. Some of the prewar Houston dwellers, who left shortly before and shortly after Pearl Harbor to accept construction and defense jobs in camps, sparsely settled rural areas, and towns, later returned to take better-paying positions at the gun plant.

Prewar employment experience.—Three-fourths of the employees interviewed (9 out of 10 men and 2 out of 5 women) reported labor-market experience prior to January 1941. Half of the Negro women (9 of 17), but only a third of the white women (17 of 50), had worked before 1941.

All but 4 men and 6 women reported their employment status in January 1941. About 9 percent of the employees (14 men and 8 women) had been engaged in service industries. Five persons ran establishments of their own; when forced to close down or sell out because of shortage of supplies or lack of personnel, they sought war jobs. A sixth (35 men and 7 women) of the group were working in miscellaneous industries such as public utilities, wholesale and retail trade, insurance, the Federal service, and in coal mines and oil fields.

Sixty-six workers (27 percent) were not working in January 1941—14 percent of the men and 60 percent of the women. Of these, 5 were unemployed and seeking work. The remainder consisted of 14 stu-

dents; 12 housewives; 3 men in military service; 30 who were not seeking work for various other reasons, including illness; and 2 who did not report their status in detail.

Prewar industrial status.—In January 1941, most of the 250 workers who had jobs were employed in industries more or less remote from the production of guns. Less than a fourth (56) were then working in manufacturing industry; 40 of these (36 men and 4 women) listed occupations in metalworking, and 16 (14 men and 2 women) were from lumbering, chemicals, the food industries, etc. The opportunity to earn good wages and gain further experience in a manufacturing line were important factors leading to the recruitment of these men and women by the Dickson plant. Some 12 percent of the workers (28 men and 1 woman) were engaged in agriculture in 1941, the majority having farms in south and east Texas. According to their statements, low prices for products, crop failures, lack of money with which to buy good farming equipment, and the increasing cost of living caused them to leave their farms and enter industry. Ten percent (25 men) were doing construction work in 1941, directing businesses of their own, working for private contractors, or helping on Government projects, principally those of the Army and Navy.

Wartime Occupations

In April 1945, approximately 88 percent of the employees interviewed were performing jobs as craftsmen and manual workers; of this group, in turn, almost half were classified as skilled, a fourth as semiskilled, and the other fourth as unskilled. The remaining 12 percent of the sample were service workers.

Since training periods for the skilled occupations were necessarily longer than for those entailing less craftsmanship and fewer job responsibilities, it is not surprising that the majority of the skilled personnel were experienced in metalworking and had seen service in the parent plant or in establishments having some features characteristic of the gun industry. Four-fifths of the skilled workers were men. One out of every four had been promoted from mechanic, machine operator, or other lower classification to departmental supervisor, foreman, or assistant foreman, and 1 out of every 8 to a job as inspector. A third of the skilled male employees operated boring machines, drill presses, turret lathes, etc. Only one worker interviewed was a machinist. A plant official attributed this to the Army's special need for machinists and to the shortage, even before the war, of fully qualified, all-round workers in that occupation.

Most women workers who held skilled positions had originally been hired for semiskilled or unskilled work. Demonstrating special aptitudes for machine work (e. g., ability to perform very precise operations requiring the use of a micrometer and measuring to close tolerances), they had received promotions to higher classifications.

A larger percentage of women than of men (40 compared to 21) performed semiskilled jobs. Training periods for such places were, on the whole, short—often less than 2 weeks, sometimes only a few days. Judged by the interviews, semiskilled operators in the gun plant seldom familiarized themselves with any machine other than their own; knowledge of a machine was frequently confined to one or

two out of many possible operations. Women, seemingly of their own volition, remained at semiskilled positions longer than men.

Unskilled occupations were usually held by persons with limited job backgrounds. Including service workers, almost a third of the men and about two-fifths of the women were classified by the Bureau's agents as unskilled. Although work records indicated extensive upgrading from unskilled to semiskilled and often, in time, from semiskilled to skilled jobs, it appears that promotions involving such revisions in grade were confined primarily to white workers. All but 9 of the 67 Negroes, for example, held unskilled classifications.

Unionization.—The personnel of the gun plant was organized by rival groups—the United Steelworkers of America (CIO) and the Independent Metal Workers Union—membership in the two being nearly equal. More than half of the employees studied (136) were identified with these unions—60 percent of the men and 43 percent of the women.

From January 1941 to the time of the study, union membership increased more among women than among men. Only a small percentage of the women as compared with a third of the men, were affiliated before 1941. There were also more nonunion Dickson men than women who had been union members during some previous employment period—half of the currently nonmember men, but only 1 percent of the women.

The percent of affiliation among Negroes (75) was higher than among the workers as a whole (54). Membership among Negro men was relatively more than twice as numerous as among Negro women (85 percent compared to 40 percent).

WARTIME HOURS AND WAGES

Normal weekly hours.—In March 1945 Dickson employees worked 10 hours per day for alternating 6- and 7-day weeks. The workweek, therefore, varied between 60 and 70 hours. For the first 6 days, time and a half was paid after 8 hours per day or 40 hours per week. On the seventh consecutive working day, double time was paid; thus, for a 7-day week employees received 90 hours' pay. Shortly before the completion of the present study, hours were lowered to 60 and Sunday work was discontinued. Plant officials attributed the change to reduction in contract requirements.

The workers interviewed seldom expressed discontent because of the long hours. For one thing, they had grown accustomed to war routines. For another, overtime pay was regarded as a symbol of achievement—dollars and cents to be sure, but also concrete evidence of having aided in the war effort. Here and there were men unaccustomed to set hours—often persons from small towns whose schedules had been a matter of individual determination. Even such employees were reconciled to the prevailing work pattern, voicing fatigue rather than dissatisfaction.

Earnings at gun plant.—In April 1945, straight-time hourly earnings of the 250 employees studied averaged $1.009 per hour, excluding overtime paid for at premium rates. The average for men was $1.04 and for women 92.2 cents per hour. Although the beginning rate was identical for all employees (60 cents), white men attained a top figure

of $1.57 and white women $1.29 per hour. This compares with 85 cents and 72½ cents, respectively, for Negroes. Fifty-eight percent of all men, but only 43 percent of all women workers, received $1.00 or more per hour on a straight-time basis. Upon the recommendation of the foremen, wage rates at the gun plant were increased 5 cents per hour after 30, 60, and 90 days of employment and then 2 cents per hour every 3 months thereafter until the top of the range was reached.

Gross weekly earnings of the 250 employees averaged $75.92. Approximately half of the men earned less and half more than that figure. Similarly, the dividing line for women was $55.00. The largest individual gross weekly earnings were $161.03 and $90.50 for top man and woman (both white), respectively. For Negroes, the corresponding figures were $83.56 and $50.63. The average net weekly earnings for all workers after deductions for income taxes, social-security taxes, and union dues were $64.76.

A few women workers interviewed raised the question of equal wages for their sex. Women were performing the same jobs as men, they said, and in equally efficient manner, but were receiving smaller checks and fewer raises. With the majority of the women, however, current earnings were satisfactory, far exceeding those (if any) received in the past. Women workers, as previously noted, were less inclined to struggle for higher wages. A few voiced the belief that some plant supervisors, through preference, selected men with higher rates of pay when trainees for new jobs were needed, because they considered men more permanent.

There was some evidence of Negroes' thinking they were being discriminated against because of their race. Several contended that they were performing the work of machine operator, but were receiving wages for a lower category of job.

Employment status of workers' families.—The data on earnings that have been given understate the situation if the family unit rather than the worker alone is considered. Including the worker, two-fifths of the families had two or more persons employed. Approximately 60 percent of the women and 36 percent of the men reported spouses, one or more children, or others, in gainful employment. More commonly, however, whether in a man's or a woman's household, there was only 1 person employed, other than the worker himself; 57 out of 65 men and 33 out of 41 women reported to this effect. Eight men and 6 women enumerated two other employed persons; 2 women listed three.

Not infrequently other members of a worker's family were employed at the gun plant. Wives frequently sought war jobs, not because they were compelled to support themselves but out of a desire to supplement their husbands' pay checks with generous ones of their own. To some married women, working in a war plant was an altogether fascinating experience, an escape from the everyday routine of keeping house. There were other wives who wanted to earn additional money with which to educate their children; still others wished to support children by former marriages. Occasionally a husband and wife were both employed, with a view to saving money for a common purpose, such as the establishment of a business after the war or the investment of savings in a home. One such instance was that of a 55-year

old man whose wife was a registered nurse earning $250 a month. This man had a long employment history, and strong in his memory were 2 years—around 1933—when he was without work of any kind. He said, "We managed to get by without help." "But," he added, "That won't happen again—that hard sledding—because my wife and I together have managed to buy war bonds, and we have our home and car paid for now. They're all ours."

The Transition to War Work

CHANGES IN JOBS AND IN EMPLOYERS DURING WARTIME

Job changes.—Job changes, including advancements in grade in the same occupation, were numerous during the war period. From 1941 to the date of the study, 9 out of 10 workers (89 percent) interviewed reported 1 or more such changes.[8] Of the 183 men, all except 6 changed jobs; 3 of the 6 were still at the same work, the other 3 gave no information. The great majority (102) shifted jobs 2 times or less. In a few extreme cases, men stated that they had changed jobs 6 to 9 times each. Job changes were reported by approximately two-thirds of all the women, most of them making 1 or 2 changes only, and no woman listing more than 4. The average number of changes for men was 2.7 and for women, 1.7. The lower figure for women is attributable, at least in part, to the fact that many of them did not enter the labor market until relatively late in the period under consideration.

The Dickson officials' policy of transferring employees from one occupation to another, and at times from one department to another, sometimes at the same wage rate, accounted for many of the changes. This frequent shifting of workers made possible not only better utilization of manpower in meeting heavy production schedules but also adjustments to cover unexpected revisions or shifts of emphasis in output.

Other plant policies, such as pay increases after stipulated periods of service, merit raises for efficient work, and competitive bidding for vacancies in higher-bracket positions by employees reaching the top of the next lower wage brackets, contributed to the general fluidity of the gun-plant force.

Changes in employers.—The schedules of the Dickson employees show the companies with which these workers were identified from January 1941 to April 1945. The workers who changed employers 1 or more times included practically all of the men and three-fourths of the women.

Some made several changes of employer in a few months. One man changed employers 7 times, two others 8 times. The majority of the men (125 out of 183) changed employers twice or less; nearly a fourth of the men (mainly transferees from the Hughes Tool Co.'s main plant [9]) changed employers only once. The average number of changes for men over the period of 4⅓ years (January 1941–April 1945) was 2.4.

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[8] Since production at the Dickson Gun Plant did not begin until February 1943, there was a period of 2 years during which some workers changed jobs before coming to the gun plant.

[9] A change from one plant to another, even if the plants were operated by the same company, was considered a change of employers.

The majority of women made only 1 or 2 changes of employer; none made more than 4. For many of the women, because of their late entrance into the labor market, the Dickson Gun Plant was their first and only employer.

Equal percentages of the white and the Negro workers made changes of employer; workers of all ages were represented, including the majority of those under 25. Married and single workers were represented in approximately equal proportions (92 and 94 percent), but there were relatively more persons who were heads of families than those who were not (96 as compared with 73 percent).

Taking into consideration only the first change made after January 1941, 3 out of every 5 workers who changed employers benefited by salary increases; 1 out of every 4 accepted decreases; and the remainder reported no difference. The major reasons given by workers for shifting to new employers were to secure higher wages and to obtain positions in essential war industries.

CHANGES IN WAGE INCOME

Three measures of wages were used to determine changes in income occasioned by the war: (1) Straight-time hourly rates, (2) gross weekly earnings, and (3) annual wage income in 1943 and 1944.

Straight-time hourly rates.—By using the pay roll nearest January for workers employed during 1941, it was possible to determine the changes in hourly rates of 149 workers from 1941 to April 1945.

All of the women reporting, both Negro and white, who were employed at the beginning of the war had had their wage rates raised. This was also true of most but not all the men (111 out of 131). Three men indicated that their wage rates had remained unchanged, and 17 had had their rates cut. The proportions of Negro and white male workers showing decreases were roughly a tenth and a seventh, respectively.

The size of the wage-rate increase for workers employed in 1941 varied substantially as between men and women. Practically all of the women (14 out of 18) reported gains of 100 percent or more as compared to only a third of the men. None of the women had increases in wage rates of less than 25 percent, although 19 out of 111 men (17 percent) fell within this category. The greater gains among women, of course, reflect the lower wage levels from which they started. Thus, the rate increases of 100 percent or more, reported by 14 of the 18 women, were based on prewar rates of less than 50 cents an hour. By contrast, only 46 of the 111 men (41 percent) had received less than 50 cents in January 1941. None of the women had earned more than 70 cents an hour, whereas a majority of the men equaled or exceeded that figure.

The differences in wage gains between Negro and white workers with prewar employment experience are worth noting. Less than a third of the Negroes, as compared to more than two-fifths of the white workers, had their rates increased by 100 percent or more. In the groups of those receiving increases of 50 to 100 percent, the proportions were reversed—30 percent of the white employees and slightly more than two-fifths of the Negroes. At the low end of the scale, gains of less than 10 percent affected 12 percent of the white workers and only one Negro.

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Gross weekly earnings.—When changes in wages are measured on the basis of hourly rates it appears from the foregoing analysis that 17 of 216 gun-plant workers with prewar employment experience actually lost ground during the war, and that the average hourly earnings of an additional 3 employees with the same background remained stationary. Such figures, however, do not take account of premium pay for overtime work, shift differentials, bonuses not related to production, and other extras. When these items are included and comparisons are made on the basis of gross weekly earnings (i. e., before deductions for social security and income taxes and union dues), it develops that of 149 for whom data were available only 4 (all men) sustained actual decreases. One man's status remained unchanged.

The 144 workers who received increases included 95 white men and 12 white women, 31 Negro men and 6 Negro women.

Experienced and inexperienced workers alike were affected by this upward trend in gross weekly earnings. A farmer who had spent 25 years on a farm at an average of under $10 per week had become a supervisor earning nearly $100 per week. A 45-year-old man who had been a $52-a-week machine operator at Hughes had become a foreman with a gross weekly check of $134.10. A $32-a-week shoe salesman collected $106.20 as a machine-tool operator. A 20-year-old white woman, for several years an $18 soda clerk but now become drill-press operator, made $50.75. A Negro man, 36 years of age, formerly drawing $12 a week as a log cutter in Louisiana, was currently receiving $40.70; another who had farmed for $18 a week was earning $56.70. From a weekly pay of $19.20 as machine hand in a local cotton mill, a white girl 27 years of age jumped to $54.25 as a turret-lathe operator. A 20-year old Negro janitress reported a weekly average of $46.15 for a current period, as compared with $17.50 as maid in a night club. Another Negro woman, previously a laundry worker at $10.80 per week, was collecting $49.70 at the gun plant; still another who had earned $7 a week as a maid in a private home in Houston exhibited a gross weekly check of $49.70.

It is evident from the above that the percentage increases realized were more dramatic than the actual money increases. For 88, or more than half, of the men and for 16 of the 18 women with prewar employment experience, gross weekly earnings rose by 100 percent or more. The distribution of increases was about the same among both Negro and white workers surveyed.

In reviewing these gains in earnings several important factors should be borne in mind: (1) Weekly earnings at the beginning of the period studied were low for most workers; (2) although the increases in weekly earnings were distributed among the Negroes and whites in approximately the same proportions, the actual earnings of Negroes were considerably below those of white workers because the former were largely in unskilled jobs; (3) the gains in gross weekly earnings must be discounted for increases in living costs; and (4) during the war years not all the workers were continuously employed and, among those who were, not all held the high-wage jobs in the Dickson Gun Plant for the entire period, and therefore few of the workers had annual wage incomes in 1943 and 1944 commensurate with their weekly earnings reported at the time of this survey (April 1945).

Annual wage income.—For most of the workers studied, data on gross annual wage income for 1943 and 1944 were obtained from the W–2 income-tax receipt form. If information was not available from this source, the employees were requested to estimate their annual incomes.

In all, annual income data were available for 225 of the 250 workers surveyed. It is estimated that 75 percent of these workers were wage or salary earners for a full year in 1943 and 88 percent in 1944. Continuous employment was reported by 145 men for 1943 and by 159 for 1944; for women, the corresponding numbers were 24 and 39. The number of white workers employed throughout the year was approximately 15 percent greater in 1944 than in 1943 (142 as against 123). The increase among the Negro workers was roughly 20 percent (56 in 1944 compared to 46 in 1943).

As reported by 225 workers, annual wage incomes were higher in 1944 than in the preceding 12 months. For both years, however, incomes for the majority of the personnel—65 percent in 1943 and 57 percent in 1944—amounted to less than $2,500. Thirteen percent of the workers in 1943 made less than $500, but only 4 percent in 1944; 8 percent in 1943 earned between $4,000 and $5,000, as compared with 13 percent in 1944. Four percent reported annual incomes of $5,000 and over for 1944; the earnings of less than 1 percent (1 individual) in 1943 exceeded this high mark.

Comparison of the incomes of men with those of women reveals that 58 percent of the men in 1943 and 48 percent in 1944 earned less than $2,500. Corresponding percentages for women workers were 86 and 81 for the 2 years.

Postwar Prospects

Replies to the question of whether the worker wanted to remain in his present occupation and location after the war indicated that 181 of the 250 employees studied desired to remain, but 30 of the 181 did not actually expect to do so.

There was no doubt on the part of the Bureau's representatives that practically all the workers wanted to stay at the gun plant as long as their jobs would last. Persons who anticipated making changes, it was observed, did not have in mind immediate changes; rather, they intended to remain, if permitted to do so, until operations ceased. Expressions of satisfaction with working conditions at the plant by numerous individual employees lent considerable support to this conclusion.

As a whole the women expressed the belief that, if personnel reductions at the plant were necessary, the men would be retained longer than the women.

Prospective job changes.—Of the 133 white male employees included in the study, only 4 expected to leave the labor market, including 3 young men who were awaiting draft into the Army and a 35-year-old man who wanted to enter a university.

Of the 59 white men who did not expect to remain in their present job, less than two-fifths were planning to reenter their usual prewar occupation. Curiously, the postwar occupational pattern of all the men studied, will, if realized, approximate the prewar situation because

many of the contemplated changes offset each other. Thus, a 61-year-old farmer with 40 years on the land wanted to manage a filling station, a farmer with 7 years' experience anticipated employment as a melter in a metal plant, a man who had worked for the Hughes Tool Co. for more than a decade hoped to become a rancher, a former ship fitter was planning to take up advertising and commercial art, a man who had been an insurance clerk for 11 years looked forward to a furniture-repair business, and a mechanic with 21 years' experience wanted to go into the restaurant business.

The 53 white male employees who had definite plans for shifting jobs expected to change to the following:

	Number
Farm and ranch	13
Establish own business	[1] 9
Enter construction work	4
Become salesman	2
Enter professional field	2
Follow mechanic trade	5
Transfer to Hughes Tool Co	18

[1] Services, 7; manufacturing, 2.

Of the 50 white women studied, 24, or almost half, were expecting to leave the labor market after the war. Twenty of the 24 wanted to become housewives, their plans being contingent largely upon the return of husbands and sweethearts from the service, 3 looked forward to living on a farm with their parents, and 1 woman indicated that she wanted to resume nurses' training.

Only 4 of the 26 white women who planned to continue working had definite jobs (other than Dickson) in mind: 1 wanted to continue in metalworking, preferably in an airplane or automobile factory, and 3 had chosen office careers.

It is of interest that, of the women who had formerly been employed, none expected to return to former occupations as checkers and machine operators in laundries, as clerks and cashiers in drug, grocery, and department stores, as waitresses and cooks in restaurants and cafeterias, or as machine operators in textile mills and box factories.

Among the 67 Negroes studied, 9 men and 3 women did not expect to remain at the Dickson plant. Six of the men expected to go back to their farms, one planned to have a restaurant business of his own, another to be a tractor driver, and the ninth was undecided about the change he would make. Two of the women desired to become maids.

Negroes, on the whole, were hesitant about discussing postwar plans. The majority did not desire to leave the plant, because they were making better wages than ever before. Although, as noted, a few Negroes had complaints about wages and the work in general, it is significant that even these neither wanted nor expected to leave the plant. One Negro male laborer previously earned, as chauffeur for a private family, as much as he made in the gun plant (his living expenses had been furnished), but still did not desire to return to the prewar job.

Men who expect to enter agriculture.—Of the 19 men (13 white and 6 Negro) who were planning on agriculture as a means of postwar livelihood, 13 (7 white and 6 Negro) were ex-farmers. Higher wages had drawn the men into industry; the expectation of lower wages and

unemployment in industry stimulated the desire to return to the land. Not unimportant, also, was the freedom of rural living. A few farsighted farmers, attributing their past failures partly to lack of modern tools and machinery, planned to use savings from their gun-plant earnings to purchase additional land or new farming equipment. Other persons who had previously worked in Houston reported actual purchases of small acreages outside the city limits with the intention of raising poultry, vegetables, or other commodities for the city market.

Five of the 19 men who were looking forward to careers in agriculture were not previously farmers. All 5 were experienced in machine work; in fact, 4 of them had previously been employed by the Hughes Tool Co. Notwithstanding 4 to 15 years each in the machine line, these men designated a preference for agriculture. One stated, "I want to be able to raise my children away from the city roughnecks, and I think farm life will improve my own health and the health of my family." Another declared, "I am tired of the lack of independence in my life. I am tired of having to heed 'whistles.' I have always wanted to farm and intend to start after the war."

It should be emphasized that whatever the secret hopes and ambitions of the minority who expected to change jobs when laid off from the gun plant, the majority (60 percent) expected to remain in their present jobs. This majority included 56 percent of the white men, 44 percent of the white women, and 82 percent each of the Negro men and women. Moreover, regardless of their expectations, nearly three-quarters of all the personnel (72 percent) "wanted" to remain. It seems safe to conclude, in view of these data, that war-plant employment has been a significant factor in redirecting the occupational attitudes of the workers studied. It has permitted new experiences, led to job comparisons, challenged old habits, and enormously expanded the lives of the workers who made the guns.

U. S. GOVERNMENT PRINTING OFFICE: 1946

Facts About Women Workers

I. WAR FACTS

A. INCREASE AMONG WOMEN IN LABOR FORCE

1. Numbers

On VE-Day about 18 million women were employed.

This represents 6½ million more than were employed in May 1940

May 1940 -

Number in labor force	-	13¾ million
" employed	-	11¼ million
" unemployed	-	2 million

2. Proportion

May 1940 - women constituted 1 in 4 of all workers.
May 1945 - " " 1 in 3 " " "

B. SOURCES OF ADDITIONAL WOMEN WORKERS

Of the net increase during the war -
About 1/3 (or about 2 million were from the unemployed group who were searching work in 1940.
1½ million women - normal increase had there been no war - Bureau of Census estimate - largely girls graduating from schools and college.
3 million war-induced women workers - former housewives or retired workers or workers from age groups who in pre-war years would not have been working.

C. INCREASE OF WOMEN IN OCCUPATIONAL GROUPS

Increase in every group (except domestic service, which lost almost 1/2 million women)

Proportions of new entrants into following occupational groups (from other occupational groups or from outside the labor force):
60 percent in manufacturing, sales, service (other than domestic)
50 percent in clerical

Strikingly significant increases
Number in manufacturing doubled
Oct. 1939 -- 2.3 million
Nov. 1943 — 4.7 million
Dec. 1944 -- 4.3 million

Oct. 1940

WOMEN'S BUREAU
U.S.Department of Labor
Washington

WOMEN AVAILABLE FOR DEFENSE WORK

Women Available for Defense Work include:

1. Experienced workers seeking jobs.
2. Workers on W.P.A. who may be further trained for defense work.
3. Workers now employed in jobs less skilled than they have done or can be trained for.
4. Women not previously in the labor market.

The following pages show the numbers of women:

1. Available from Employment Rolls for Certain Types of Defense Work.
2. W.P.A. Workers Who May be Useful in Defense.

Prepared October 1940

WOMEN'S BUREAU
U.S. Department of Labor
Washington

WOMEN AVAILABLE FROM EMPLOYMENT ROLLS FOR CERTAIN TYPES OF DEFENSE WORK

The following lists show the numbers of women seeking employment in various defense industries, in 14 major industrial States in April 1940, the latest figures of the Bureau of Employment Security that are by occupation and sex. 1/ The occupations of the women seeking metal factory work are shown on the next page.

1. For Metal Factory Work

Connecticut -	1,759
Michigan -	1,658
New York (total) -	1,521
Buffalo -	407
New York City area	299
Syracuse -	279
Rochester -	68
Illinois -	1,238
Ohio -	1,107
New Jersey-	1,097
Indiana -	479
Pennsylvania -	368
Massachusetts -	327
Wisconsin -	212
Missouri -	150
Rhode Island -	124
Maryland -	123
California -	103
Minnesota -	73

2. For Electrical Supply Factory Work

New Jersey -	2,106
New York (total) -	1,572
New York City area -	632
Buffalo -	487
Rochester -	257
Syracuse -	38
Illinois -	1,287
Ohio -	889
Massachusetts -	857
Connecticut -	832
Michigan -	795
Pennsylvania -	668
Indiana -	533
Wisconsin -	268
Rhode Island -	207
Missouri -	199
California -	69
Maryland -	48
Minnesota -	24

3. For Work on Transportation Equipment

Illinois -	549
Michigan -	529
Indiana -	237
Ohio -	176
New York -	75
New Jersey -	68
Pennsylvania -	33
Massachusetts -	21
Connecticut -	3

4. For Work in Chemical Plants

New York - (Total)	214
New York City area -	170
New Jersey -	162
Pennsylvania -	28
Illinois -	25
Ohio -	23
Michigan -	23
Massachusetts -	22
Connecticut -	14

5. For Work on Watches and Clocks

Rhode Island -	1,192
New York (Total) -	424
New York City area -	345
Rochester -	76
Massachusetts -	308
Illinois -	135
Connecticut -	150
New Jersey -	129
Pennsylvania -	21

1/ Regular reports from States to the Bureau do not designate the specific occupations; such a report is only by special request. Prior to April 1940 the last such request was in 1938. Recent monthly figures are not by occ.

~~Table~~ - TYPES OF METAL-WORK OCCUPATIONS FOR WHICH WOMEN ARE AVAILABLE From Employment Rolls, 4 REGIONAL GROUPS OF STATES

	Ohio, Ind., Ill., Mo.	N.Y., Pa., N.J., Md.	Mass., R.I., Conn.	Mich., Wis., Minn.
Total 1/	2,974	3,109	2,210	1,943
Rolling, stamping	1,010	948	550	1,121
Machine shop, n.e.c.	369	533	186	363
Fabrication, n.e.c.	414	447	294	84
Welders, flame cutters	104	93	13	67
Machinists	202	133	159	29
Filers, grinders	116	131	53	54
Foundry, n.e.c.	100	83	11	104
Furnacemen, smelters	5	21	1	1
Toolmakers, diesinkers	3	7	4	2
Blacksmiths, forgemen	6	9	1	3
Tinsmiths, coppersmiths	1	8	4	2
Molders	1	10	-	-
Heat treaters, annealers	5	1	2	2
Ore dressers	-	1	1	1

1/ Total exceeds details. Each State had a group of "inter-industry occupations" in metal work.

~~WOMEN'S BUREAU~~
U.S. Department of Labor
~~Washington~~

WOMEN W.P.A. WORKERS WHO MAY BE USEFUL IN DEFENSE WORK

Some figures have been collected to give an idea as to women on W.P.A. projects who may be useful in defense industries, especially with additional training. The attached tables show (1) Numbers of power sewing machine operators in various States, and (2) Where W.P.A. workers on selected projects were located in the 19 States reporting largest numbers.

The operation of power sewing machines probably is the most similar to types of factory employment for which women could be trained in defense industries. The W.P.A. reported 17,230 workers operating such machines in December 1939. Of these about 3,200 worked on high speed machines. (A few States have given reports on this subject for later dates).

Workers on other types of projects that may be useful in certain kinds of defense work, as reported by the W.P.A. at the end of May 1940, include 7,500 doing public health and hospital work, 3,500 distributing surplus commodities, 6,600 at work on other production projects, 21,200 at work on school lunch projects, 17,600 engaged in education, and 23,900 doing work on various types of research, records, and surveys. Obviously these numbers are changing frequently. There is some indication they are growing smaller as more persons are absorbed into private employment.

State reports sent to the W.P.A. show only the State totals on such projects. In order to obtain further information as to where these women were located, the Women's Bureau, at the suggestion of the W.P.A., wrote to W.P.A. directors in the States that had reported the largest numbers on professional and service projects.

TABLE I - WAGE WORKERS ON SEWING PROJECTS WHO OPERATED POWER MACHINES

Reported by W.P.A. as of December 20, 1939

Administrative Region and State	Total	Low Speed--31-15, 61W, and others	High Speed	Chief Location (city)
CONTINENTAL UNITED STATES	17,230	14,031	3,199	
REGION I - TOTAL	1,132	1,022	110	
Connecticut	3	-	3	New Haven
Maine	30	30	-	
Massachusetts	1,014	935	79	Not reported
New Hampshire	38	38	-	
Rhode Island 1/	45	19	26	1/
Vermont	2	-	2	2/
REGION II - TOTAL	3,338	2,279	1,059	
New Jersey	232	232	-	
New York City	1,895	1,177	718	
New York State	476	454	22	2/
Pennsylvania	735	416	319	Not reported
REGION III - TOTAL	47	36	11	
Delaware	-	-	-	
District of Columbia	14	14	-	
Maryland	11	1	10	2/
Virginia	5	4	1	Not reported
West Virginia	17	17	-	
REGION IV - TOTAL	6,443	5,658	785	
Illinois 3/	2,424	2,300	124	3/
Indiana	249	238	11	Indianapolis Evansville
Michigan	1,116	1,035	81	Not reported
Missouri	227	196	31	St. Louis
Ohio 4/	2,427	1,889	538	4/
REGION V - TOTAL	499	467	32	
Alabama	111	96	16	Not reported
Florida	49	45	4	Not reported
Georgia	-	-	-	
Kentucky	72	70	2	Not reported
North Carolina	245	236	9	Durham
South Carolina	-	-	-	
Tennessee	17	16	1	Nashville
REGION VI - TOTAL	312	300	12	
Arkansas	-	-	-	
Louisiana	306	300	6	Not reported
Mississippi	5	-	5	Not reported
Oklahoma	-	-	-	
Texas	1	-	1	Houston

Footnotes on next page.

Administrative Region and State	Total	Low Speed--31-15, 61W, and others	High Speed	Chief Location (city)
REGION VII - TOTAL	3,173	2,587	586	
Iowa	520	477	43	Des Moines
Kansas	144	101	43	Not reported
Minnesota	1,286	953	333	Minneapolis St. Paul Duluth
Nebraska	477	397	80	Not reported
North Dakota	160	160	-	
South Dakota	17	15	2	2/
Wisconsin	569	484	85	Not reported
REGION VIII - TOTAL	1,260	1,172	88	
Colorado	703	640	63	Not reported
Montana	435	428	7	2/
Idaho	5	-	5	2/
New Mexico	-	-	-	
Utah	108	104	4	2/
Wyoming	9	-	9	2/
REGION IX - TOTAL	1,026	510	516	
Arizona	46	44	2	2/
Northern California 5/	357	87	270	5/
Southern California 5/	293	134	159	5/
Nevada	-	-	-	
Oregon	278	244	34	2/
Washington	52	1	51	Not reported

1/ Rhode Island reports for June 30, 1940 show 637 on power machines, largely in Providence, Woonsocket, Pawtucket.

2/ Not ascertained.

3/ Illinois reports for June-July 1940, 1,800 on power, 1,377 on treadle machines, chiefly in Chicago, Rockford, Herrin, and Peoria. (Total, 3,177).

4/ Later Ohio reports show no high speed operators; other power sewing machines, 1,878 in May, 1,613 in July 1940; the largest numbers were in Cleveland, Columbus, Akron, Cincinnati, Toledo.

5/ California reports for May 1940 show on high speed Northern 450, Southern 179; on other power Northern 2,750, Southern 77. Chief numbers in South were in Los Angeles; in North in San Francisco, Oakland, Santa Rosa, Fresno. (Total, 3,456).

TABLE II. - NUMBER OF WOMEN REPORTED ON SELECTED W.P.A. PROJECTS
(All figures as reported by the W.P.A.) 1/ 2/ (Includes 19 States with largest numbers reported in May 1940)

	All projects 2/	Production projects (Except sewing)	Sewing projects: Total	Sewing projects: Machine operators 3/	Sewing projects: School lunches	Distribution of surplus commodities	Public health & hospital work	Research & surveys (Inc. pub. & hist. records)	Education
Pennsylvania 1/	27,677	29	19,193	4/ 735	32	447	4/ 450	1,435	963
Philadelphia	6,977	-	5,791	-	-	71	87	909	117
Allegheny	3,063	-	2,637	-	-	137	18	140	131
Luzerne	1,425	-	1,249	-	-	29	23	37	87
Lackawanna	1,162	-	892	-	-	20	40	20	90
Illinois 1/	26,704	618	8,264	5/ 3,177	1,687	384	1,486	2,806	1,462
Chicago	12,358	361	4,308	1,211	245	302	1,010	2,453	513
Ohio 1/ 6/	21,585	-	9,823	6/ 2,427	1,576	187	570	1,576	765
Cleveland	5,278	-	2,408	-	259	85	252	729	157
Toledo	1,677	-	811	-	207	36	56	80	54
Cincinnati	1,885	-	1,082	-	104	-	89	80	74
Akron	1,646	-	532	-	225	22	27	126	73
Columbus	1,353	-	529	-	88	18	131	122	46
Youngstown	1,031	-	323	-	117	2	-	48	24
Texas 1/	20,912	554	7/ 12,081	1	876	171	7/ 270	793	1,017
Fort Worth	1,259	65	671	-	2	4	-	63	58
Houston	1,131	16	346	1	44	14	26	87	31
San Antonio	1,121	10	225	-	16	8	69	145	68
Dallas	846	-	416	-	2	9	-	80	47
Waco	507	54	283	-	4	14	-	1	18
New York									
New York City 1/	13,465	42	1/ 1,877	1,895	1,307	43	1,387	2,283	1,520
State (except city) 1/	4,486	-	3,490	476	17	-	11	175	407
California 1/	16,605	372	8/ 5/ 7,480	5/ 3,456	1,011	195	5/ 449	986	1,055
Southern	N.R.	134	2,934	256	250	105	162	144	469
Los Angeles	2,362	11	1,018	153	165	56	130	100	309
San Diego	716	45	419	2	24	10	30	27	56
San Bernardino	651	-	457	91	6	15	1	-	28

(See page 3 for footnotes)

	All projects 2/	Production projects (Except sewing)	Sewing projects: Total	Sewing projects: Machine operators 3/	School lunches	Distribution of surplus commodities	Public health & hospital work	Research & surveys (Inc. pub. & hist. records)	Education
California (cont'd)									
Northern	9,779	-	4,546	3,200	450	89	287	653	437
San Francisco	3,031	-	1,492	1,010	42	62	198	240	217
Oakland	2,487	-	977	840	-	2	89	81	108
Massachusetts 1/	13,092	267	7,213	1,014	347	231	173	1,423	539
Michigan 1/	10,405	168	5,301	1,116	562	37	42	980	521
Missouri 1/	9,813	418	4,884	227	9/ 810	32	477	699	400
St. Louis	N.R.	-	-	131	-	-	291	203	103
Kansas City	N.R.	-	-	96	-	-	46	311	89
New Jersey 1/	9,714	180	3,657	232	437	36	10/ 273	1,222	468
Essex	1,928	48	794	-	41	10	44	211	67
Hudson	1,689	44	743	-	79	2	-	315	108
Passaic	862	4	395	-	28	2	59	71	36
Atlantic	850	23	366	-	54	4	-	13	42
Camden	738	33	212	-	77	-	-	161	11
Bergen	763	4	224	-	28	-	4	85	65
North Carolina 1/	8,532	298	3,281	245	1,023	231	28	395	484
Georgia 1/	7,660	224	11/ 3,130	-	1,081	97	187	544	635
Atlanta	1,595	18	787	-	104	12	125	185	84
Virginia 1/	6,680	381	2,708	5	640	40	297	499	355
Oklahoma 1/	6,549	-	2,833	-	736	172	-	267	197
Oklahoma City	495	-	240	22	11	20	-	122	58
Mississippi 1/	6,366	129	2,180	5	1,385	122	37	619	404
South Carolina 1/	6,323	457	1,840	-	1,195	58	129	104	381
Richland	591	83	133	-	29	7	20	31	36
Greenville	558	67	191	-	80	5	46	14	16

(See page 3 for footnotes)

	All projects 2/	Production projects (Except sewing)	Sewing projects: Total	Sewing projects: Machine operators 3/	School lunches	Distribution of surplus commodities	Public health & hospital work	Research & surveys (Inc. pub. & hist. records)	Education
Florida 1/	6,138	458	2,857	49	518	109	148	349	324
Hillsboro	1,288	88	851	-	73	12	64	40	27
Duval	748	80	179	-	19	26	19	64	64
Alabama 1/	6,083	624	1,751	111	341	101	164	358	597
Birmingham	N.R.	326	331	111	111	40	104	231	115
Indiana 1/	6,035	21	3,156	249	-	64	92	168	231
Indianapolis	1,178	2	329	80	34	27	17	69	52
Evansville	620	-	451	62	6	2	-	12	27

1/ Totals for State (or major area) shown as reported by W.P.A. for May 1940. Numbers operating sewing machines shown as reported by W.P.A. for December 1939. Details as to localities shown as reported by State administrators of W.P.A., chiefly for May 1940.

2/ Total for State (or major area) usually exceeds details listed here.

3/ Details as to high speed machines shown in Table I.

4/ Over 450 in sewing each in Westmoreland, Fayette, Northumberland, Washington, Schuylkill; 48 health and hospital in Schuylkill.

5/ Figures for May 1940 as totalled from reports by locality (see footnote 1); in Illinois 1,800 on power, 1,377 on treadle machines, over 300 in each city Herrin, Rockford, Peoria.

6/ Chief city listed, though area reported includes county. More than 100 housekeeping aides in May each in Cleveland, Cincinnati, Columbus, Akron, Canton, Youngstown, Warren, Zanesville. All W.P.A. numbers declined May to July. Later figures on sewing show no high speed machine operators, total on machines in May 1,878, in July 1,613; in May Cleveland 650, Columbus 370, and over 250 each in Cincinnati, Youngstown.

7/ On sewing 100 or over each in El Paso, Austin, Amarillo; 25-40 health and hospital in El Paso, Amarillo.

8/ More than 100 each on sewing projects in South: Long Beach, Riverside, Pasadena, Anaheim, Santa Ana; North: Stockton, Fresno, San Jose, Sacramento, Bakersfield.

9/ School lunch in Dunklin, Pemiscot (extreme southeast).

10/ In health and hospital 45-30 in Mercer and Monmouth.

11/ More than 100 on sewing each in Macon, Decatur, Savannah, Marietta, or their counties. Health and hospital 32-20 in Columbus, Macon.

WOMEN'S BUREAU
U.S. Department of Labor
Washington

WOMEN AVAILABLE FOR WORK IN DEFENSE INDUSTRIES
(June 1940)

Numbers of Women Available

At least 1½ million women probably would be immediately available for defense work, at least a fifth of these already having the necessary skills. This includes those actively seeking work through the Employment Security Agency, and those now on W.P.A.

There is a large additional group who have only partial employment and would be available for further work. Indicated by the 1937 Census of Unemployment this would be at least 1/2 million. It is probable that this is not an overestimate for the present, since the most recent manufacturing employment indexes (March 1940) are below those of November 1937.

Women Who Are Skilled

Well over 250,000 of the unemployed women are skilled according to a recent preliminary report of the Employment Security Bureau. Of these skilled women, 34 percent are in Middle Western States; 22 percent in Middle Atlantic States (excluding New York); 20 percent in New England States; 14 percent in South Eastern States; 8 percent in Far Western and South Western States (excluding California).

Added to those unemployed and on W.P.A. work, there are large numbers of women now at work on jobs less skilled than they are accustomed to performing. These could quickly be called back to their more skilled occupations. Their number cannot be estimated.

Women do much of the skilled work in the manufacture of certain textiles and clothing, needed in a defense program. As these expand, additional women can be used in these types of work. For example, women comprise the following proportions of skilled workers:

	Percent
Knitted outerwear	76
Hosiery (full-fashioned)	52
Knitted underwear	30
Boots and shoes (not rubber)	22
Cotton goods	21

Experience as to Types of Work Women Perform Well

1. Women excel in work requiring care and constant alertness, good eyesight, and use of light instruments, such as gauges, micrometers, vernier calipers - work calling for little physical exertion. These are characteristics of such jobs as inspection of castings, machinery and finished parts, of routine powder analysis, of testing electrical equipment.

2. Women excel at work requiring manipulative dexterity and speed but which permit them to set their own tempo and to work in a sitting position. These are characteristics of bench work calling for "laying out" work for machine operators, operating very small machines to finish small and irregular parts, assembling delicate instruments and machines, loading shells, filling powder bags.

3. Women excel in work requiring skill but little strength, either in handling parts or setting up of machines. These are characteristics of drilling machines, lathes, milling machines, grinding and polishing machines operating on small parts.

4. Women operate large machines successfully on heavy work when such work necessitates use of lifting devices and pneumatic chucks, whether work is done by men or women.

SKILLED WOMEN WORKERS REPORTED BY THE

BUREAU OF EMPLOYMENT SECURITY

Latest figures available are preliminary reports on skilled workers on the Employment rolls, April 1940.

These include 33 States; important industrial States omitted are California and New York.

Skilled Women Workers Available

Total -	250,088
Technicians -	2,468
Skilled -	247,620

Distribution in Chief Geographic Areas

	Number	Percent
Midwest -	84,515	34
Middle Atlantic (N.Y. missing)	54,458	32
New England (Me. missing)	50,223	20
South (east of Miss.) (Miss. and Tenn. missing)	35,269	14
Far West and Southwest (Cal. missing)	20,999	8

Women Reported in Selected States

New Jersey	31,000	Indiana	6,000
Massachusetts	28,000	Minnesota	6,000
Pennsylvania	22,000	Washington	5,000
Ohio	14,000	Wisconsin	5,000
Illinois	14,000	Alabama	4,000
Michigan	11,000	Iowa	3,000
Missouri	11,000	Florida	3,000
North Carolina	11,000	New Hampshire	2,000
Nebraska	11,000	South Carolina	2,000
Texas	10,000	Vermont	1,000
Connecticut	9,000	West Virginia	1,000
Rhode Island	8,000		

WOMEN ON EMPLOYMENT SECURITY ROLLS, APRIL 1938

		Percent
Total 1/	1,376,831	
Manufacturing 1/	392,459	100.0
Textiles and their products	191,387	49.0
Food and allied	55,424	14.0
Machinery (not transportation)	29,603	7.5
Leather and its products	15,872	4.0
Iron and steel (not machinery)	13,186	3.0
Printing and publishing	12,701	3.0
Chemicals	9,033	2.0
Non-ferrous metals	9,001	2.0
Transportation equipment	8,871	2.0
Paper and allied	7,246	1.5
Stone, clay and glass	5,930	1.0
Rubber products	5,563	1.0
Distribution	117,152	

1/ Total exceeds details shown here.

WOMEN REPORTED FROM W.P.A. ROLLS

Latest available figures, reported to the Women's Bureau by telephone, are for April 1940

Women available - 331,003

On power machines - High speed - 3,199
Low speed - 14,031
17,230

WOMEN'S BUREAU
U.S.Department of Labor
Washington

April 1940

WOMEN AVAILABLE FROM EMPLOYMENT ROLLS FOR CERTAIN TYPES OF DEFENSE WORK (April 1940)

I. Women Available in 14 States for Work in 5 Industries

1. Metal factories
2. Electrical supply factories
3. Transportation equipment
4. Chemical plants
5. Watches and clocks

II. Metal-Work Occupations for Which Women Are Available

A. In 14 States
B. In 4 Regional Groups of States

III. Certain Contracts Let in 24 States and Women Available for Such Work
(Includes also reports for 8 other States - 32 in all:
2 in which no contracts were reported
6 in which details as to occupations not given)

A. States with reports on Contracts Let and Women Available

1. Illinois, Indiana, Ohio, Kentucky, Missouri, Iowa
2. Michigan, Wisconsin, Minnesota
3. New York, Pennsylvania, New Jersey, Maryland
4. Connecticut, Massachusetts, Rhode Island
5. California, Washington
6. Texas
7. Alabama, Georgia, North Carolina, Tennessee, Virginia

B. States with No Contracts reported
Florida (with group 7); Maine (with group 4)

C. States with Contracts Reported but no Detail as to Women
Kansas, Nebraska (with 1)
Vermont (with 4)
Colorado (with 5)
Louisiana, Oklahoma (with 6)

I. WOMEN AVAILABLE IN 14 STATES FOR 5 TYPES OF WORK (April 1940)

1. For Metal Factory Work

Connecticut -	1,759
Michigan -	1,658
New York -	1,521
Buffalo -	407
New York City Area-	299
Syracuse -	279
Rochester -	68
Illinois -	1,238
Ohio -	1,107
New Jersey -	1,097
Indiana -	479
Pennsylvania -	368
Massachusetts -	327
Wisconsin -	212
Missouri -	150
Rhode Island -	124
Maryland -	123
California -	103
Minnesota -	73

By Regions

Mass.,R.I.,Conn. -	2,210
N.Y.,Pa.,N.J.,Md.-	3,109
Ohio,Ind.,Ill.,Mo.-	2,974
Mich.,Wis.,Minn. -	1,943
or Ill.,Wis. -	1,450
Ind.,Mich.-	2,137

2. For Electrical Supply Factory Work

New Jersey -	2,106
New York -	1,572
New York City Area -	632
Buffalo -	487
Rochester -	257
Syracuse -	38
Illinois -	1,287
Ohio -	889
Massachusetts -	857
Connecticut -	832
Michigan -	795
Pennsylvania -	668
Indiana -	533
Wisconsin -	268
Rhode Island -	207
Missouri -	199
California -	69
Maryland -	48
Minnesota -	24

By Regions

Mass.,R.I.,Conn. -	1,896
N.Y.,Pa.,N.J.,Md. -	4,394
Ohio,Ind.,Ill.,Mo. -	2,908
or Ill,Wis. -	1,555
Ind.,Mich. -	1,328
Michi,Wis.,Minn. -	1,087

3. For Work on Transportation Equipment

Illinois -	549
Michigan -	529
Indiana -	237
Ohio -	176
New York -	75
New Jersey -	68
Pennsylvania -	33
Massachusetts -	21
Connecticut -	3

By Regions

Mass., Conn. -	24
N.Y.,N.J.,Pa.	176
Ohio,Ind.,Ill.,Mich. -	1,491

4. For Work in Chemical Plants

New York -	214
New York City Area-	170
New Jersey-	162
Pennsylvania -	28
Illinois -	25
Ohio -	23
Massachusetts -	22
Connecticut -	14
Michigan -	23

By Regions

Mass.,Conn. -	36
N.Y.,N.J.,Pa.-	404
Ohio,Ill.,Mich.-	71

5. For Work on Watches and Clock

Rhode Island -	1,192
New York -	424
New York City Area -	345
Rochester -	76
Massachusetts -	308
Illinois -	135
Connecticut -	150
New Jersey -	129
Pennsylvania -	21

By Regions

Mass.,Conn.,R.I.-	1,650
N.Y.,N.J.,Pa. -	574

II.A. - TYPES OF METAL-WORK OCCUPATIONS FOR WHICH WOMEN ARE AVAILABLE IN 14 STATES (April 1940)

	Ohio	Ind.	Ill.	Mo.	Mich.	Wis.	Minn.	N.Y.	Pa.	N.J.	Md.	Mass.	Conn.	R.I.	Calif.
All occupations 1/	1,107	479	1,238	150	1,658	212	73	1,521	368	1,097	123	327	1,759	124	103
Rolling, stamping	394	196	338	82	966	137	18	442	92	332	82	93	400	57	41
Machine shop, n.e.c.	184	65	102	18	341	20	2	395	49	86	3	42	133	11	-
Fabrication, n.e.c.	138	40	209	27	33	18	33	195	53	165	34	32	248	14	29
Welders, flame cutters	55	15	30	4	58	9	-	9	15	68	1	9	2	2	5
Machinists	69	23	110	-	27	-	2	112	3	17	1	17	137	5	1
Filers, grinders	56	15	46	5	48	5	1	71	17	42	1	21	31	1	15
Foundry, n.e.c.	43	35	19	3	92	8	4	30	46	7	-	6	3	2	3
Furnacemen, smelters	-	1	4	-	-	-	1	19	1	1	-	-	1	-	1
Toolmakers, diesinkers	2	-	1	-	2	-	-	-	1	6	-	2	-	2	2
Blacksmith, forgemen	1	-	5	-	3	-	-	6	2	1	-	-	1	-	-
Tinsmiths, coppersmiths	-	-	1	-	1	1	-	4	-	4	-	1	-	3	-
Molders	-	-	1	-	-	-	-	10	-	-	-	-	-	-	1
Heat treaters, annealers	4	-	1	-	2	-	-	-	1	-	-	-	-	2	1
Ore dressers	-	-	-	-	-	-	1	-	-	1	-	1	-	-	-

1/ Total exceeds details. Each State had a group "inter-industry occupations" in metal work.

II.B. - TYPES OF METAL-WORK OCCUPATIONS FOR WHICH WOMEN ARE AVAILABLE IN 4 REGIONAL GROUPS OF STATES (April 1940)

	Ohio, Ind., Ill., Mo.	N.Y., Pa., N.J., Md.	Mass., R.I., Conn.	Mich., Wis., Minn.
Total 1/	2,974	3,109	2,210	1,943
Rolling, stamping	1,010	948	550	1,121
Machine shop, n.e.c.	369	533	186	363
Fabrication, n.e.c.	414	447	294	84
Welders, flame cutters	104	93	13	67
Machinists	202	133	159	29
Filers, grinders	116	131	53	54
Foundry, n.e.c.	100	83	11	104
Furnacemen, smelters	5	21	1	1
Toolmakers, diesinkers	3	7	4	2
Blacksmiths, forgemen	6	9	1	3
Tinsmiths, coppersmiths	1	8	4	2
Molders	1	10	-	-
Heat treaters, annealers	5	1	2	2
Ore dressers	-	1	1	1

1/ Total exceeds details. Each State had a group of "inter-industry occupations" in metal work.

III. - CERTAIN CONTRACTS SET IN 24 STATES

(not checked)

ILLINOIS AND INDIANA

	Illinois	Indiana
Women Available - Total - 1/	**11,522**	**6,390**
Metal -	1,238	479
Electrical	1,287	533
Chemical	25	12
Transportation equipment	549	237
Clock and watch	135	12

1/ Except "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Chicago
- Hydraulic press
- Drilling machines
- Valve machines

Tractors
- Electric trucks
- Locomotive cranes
- Bending machines
- Teletype machines

State
- Tractors, motor graders
- Locomotives

Indiana
- Trucks
- Drilling machines
- Boosters
- Air compressor
- Engine lathes

Metal

Parts and Smaller Tools

Chicago
- Valves
- Booster, metal components
- Brass forgings

State
- Reel units
- Diesel parts

Indiana
- Chains
- Tracks, gate frames
- Airplane parts, carburetors, wheel assemblies

Instruments

State
- Governors

Electrical

Chicago
- Telephone equipment
- Electrical apparatus
- X-ray outfits
- Welding electrodes
- Telephones
- Radios

State
- Transformers

Indiana
- Acetylene cylinders

Munitions

Chicago
- Cartridge containers
- Gas masks
- Ammunition
- Ammunition parts

State
- Machined shells

Indiana
- Machined shells

OHIO AND KENTUCKY

Women Available -	Total 1/	Ohio 14,022	Kentucky 3,302
	Metal work -	1,107	47
	Electrical -	889	143
	Chemical -	23	3
	Transportation equipment -	176	-
	Clock and watch -	14	-

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier machines
- Kentucky - Elevators
- Ohio -
  - Cleveland -
    - Turret lathes
    - Light tank hulls
    - Electric trucks
    - Twist drills
    - Forging machinery
  - Cincinnati -
    - Truck tractors
    - Lathes
    - Boring machines
    - Planers
    - Radial drills
    - Turret lathes
    - Milling machines
  - State -
    - Drill presses
    - Gun carriages
    - Power shovels
    - Lathes
    - Presses
    - Locomotives
    - Gun boring lathes
    - Bridge crane
    - Drop hammer

Metal

Parts and Small Tools
- Cleveland -
  - Pump assemblies
  - Diesel parts
  - Carriage bolts
  - Welders
  - Small tools
- Cincinnati -
  - Forgings
  - Press brakes
- State -
  - Screw drivers
  - Propeller blades
  - Machining shells
  - Motor parts

Electrical

- Cleveland - Welding electrodes
- State - Lamp assemblies
  - Signals
  - Transformers
  - Aircraft flares
  - Generator sets
  - Searchlight towers

Instruments

State - Telescope mounts

Munitions

- Cincinnati - Practice bombs
- State - Fuses
  - Gas mask carriers

IOWA, KANSAS, MISSOURI, NEBRASKA

	Iowa	Missouri	Kansas	Nebraska
Women Available - Total 1/ -	2,454	10,497	1,459 2/	619 2/
Metal	5	150		
Electrical	10	199		
Chemical	1	6		
Transportation equipment	2	19		
Clocks and watches	2	7		

1/ Except "unskilled."
2/ Details not secured.

Contracts Let Include (August 1940) -

Metal

Heavier Machines
Missouri - Gas ranges
Kansas - Airplanes

Electrical

Missouri - Transmitters

Munitions

Iowa - Machine-guns assemblies
Nebraska - Machines shells

MICHIGAN

Women Available - Total 1/	Michigan 11,119
Metal	1,658
Electrical	795
Chemical	23
Transportation equipment	529
Clocks and watches	14

1/ Except "unskilled."

Contracts Set Include (August 1940) -

Metal

Heavier Machines

Michigan - Trucks
Presses
Twist drills
Profiling machines
Shovels
Milling machines
Shaper
Tractors

Metal

Parts and Small Tools

Michigan -Tools,fixtures
Diesel parts
Forgings
Seats,valves
Gages
Wheel and brake assemblies
Brass forgings
Aircraft engines and parts

Electrical

Michigan - Detonators

Munitions

Michigan - Fuses, bombs,machining shells
Cartridge cases
Machined shells
Machine guns

WISCONSIN AND MINNESOTA

	Wisconsin	Minnesota
Women Available - Total 1/ -	5,761	6,086
Metal	212	73
Electrical	268	24
Chemical	2	2
Transportation equipment	19	1
Clock and watch	7	1

1/ Except "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Wisconsin - Jack assemblies
Heavy tractors
Broaching mch.
Electric drills
Milling machines
Trailers and dollies
Motorcycles
Bridge cranes
Turret lathes
Power shovels
Boring machines

Minnesota - Winches
Gas ranges

Metal

Parts and Small Tools

Wisconsin - Sextants
Castings and armor plates
Valves
Power units
Reel units

Minnesota - Fuel oil pumps
Hydraulic parts

Electrical

Wisconsin - Electrical equipment

Munitions

Minnesota - Machining shells

NEW YORK

Women Available -	Total 1/ -	New York City Area	Buffalo	Syracuse	Rochester
Metal -	1,521	299	407	279	69
Electrical -	1,672	632	487	47	257
Chemical -	214	170	6	3	-
Transportation equipment -	75	17	29	9	1
Professional & scientific apparatus	5	-	-	-	-
Clock, watch & jewelry	415	356	22	3	76

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

New York City Area
- Drills
- Flat cars
- Elevator machinery
- Electric hoists
- Hydraulic press
- Towing carriage

Rochester - Engine lathes
Syracuse - Engine lathes
State - Bridge and wall cranes

Parts and Small Tools

New York City Area
- Cylinder forgings
- Tube fittings
- Steel rods
- Brass nuts

Buffalo
- Airplane parts

State
- Pliers
- Aircraft axles
- Compressors, girders, wire

Electrical

New York City Area
- Radio receivers
- Radio cabinets
- Searchlight units
- Electric cable

Rochester
- Telephone switchboards

Syracuse
- Lamp assembly

State
- Electrical equipment
- Magneto assemblies
- Power plant assemblies

Instruments

New York City Area
- Timing apparatus
- Aircraft clocks
- Navigation watches
- Telescopes
- Height finders
- Elbow telescopes

Rochester
- Optical instruments
- Telescopes
- Height finders
- Cameras

State
- Aircraft cameras
- Aircraft instruments

Munitions

New York City Area
- Machine shells
- Bomb bodies
- Rifle parts

Rochester
- Machine gun assemblies
- Machine shells

PENNSYLVANIA

Women Available - Total 1/ - 21,417

Metal -	368
Electrical -	1,027
Chemical -	28
Transportation equipment -	33
Clock and watch -	20

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Philadelphia Area
- Diesel engines
- Planers, radial drills
- Milling machines
- Lathes

State
- Diesel engines
- Power shovels
- Trailers
- Hydraulic press

Parts and Small Tools

Philadelphia Area
- Steel forgings, tubes for guns
- Files, rasps
- Doors, latches
- Hydraulic valves
- Diesel parts
- Machine forgings
- Gears
- Tube fittings

Pittsburgh
- Nuts and bolts
- Forgings

State
- Chemical containers
- Steel rods
- Centrifugal castings
- Base rings
- Windlasses, steering gear
- Die castings
- Wire

Electrical

Philadelphia Area
- Storage batteries

Pittsburgh
- Transformers
- Electrical equipment, arc welders, lamps, etc.

State
- Electric trucks
- Generator sets

Instruments

Philadelphia Area
- Air ejectors
- Telescope mounts
- Testing machines

State
- Turbine governor
- Instruments

Munitions

Philadelphia area -
- Gun barrels
- Ammunition parts

State -
- Gun barrel forgings
- Gun saddles
- Shell forgings
- Machining shells
- Bombs, metal components
- Gun carriages

NEW JERSEY AND MARYLAND

Women Available -	New Jersey	Maryland
Total 1/	28,495	4,777
Metal -	1,097	123
Electrical -	2,105	68
Chemical -	162	14
Transportation equipment -	68	-
Professional & scientific apparatus -	4	-
Clock, watch, jewelry	118	4

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Gear-cutting machine

Maryland - Elevators
Blast cleaning rooms
Maintenance equipment
Gun carriages

Parts and Small Tools

Wire
Insulated cable
Fire extinguishers
Pliers
Aircraft engine parts, crank shafts
Fire control apparatus

Munitions

Pistols
Machinegun parts
Guns
Ammunition boxes

Electrical

Lamp assemblies
Electrical equipment, rectifiers
Radio parts
Crystal unit coil set
Lamp mountings
Generators
Signals
Evergizer assemblies

Maryland - Signals
Welding electrodes
Switch gear

Instruments

Surgical instruments
Instruments
Aircraft instruments

CONNECTICUT

Women Available - Total 1/ -	8,795
Metal -	1,759
Electrical -	632
Chemical -	302
Transportation equipment	3
Clock, watch, jewelry	150

1/ Excluding "unskilled."

Contracts Let Include (August 1940)

Metal

Heavier Machines

Bridgeport
- Drilling machines
- Boring machines, turret, lathe
- Routing machine
- Pneumatic drills

State
- Fuel pumps
- Chucking machine
- Lathes
- Reaming machines
- Drop hammers
- Gaging machines

Parts and Small Tools

State
- Wire rope
- Diesel parts
- Airplane parts
- Aircraft engines
- Propeller assemblers
- Turbines

Munitions

Bridgeport
- Cartridges
- Ammunition

State
- Machined shells
- Fuses, bombs
- Cartridge cups and discs
- Fuse parts

Electrical

- Code transmitter
- Electrical equipment
- Signals (ground, parachute)

Instruments

- Desk clocks
- Speed control units

MASSACHUSETTS

Women Available - Total 1/ 26,036

Metal -	32327
Electrical -	857
Chemical -	22
Transportation equipment	21
Clocks and watches	308

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Lathes, mills, grinders
Cylinder grinder
Engine lathes
Wood screws
Topping machine
Boring Machine
Motorcycles

Parts and Small Tools

Machinegun parts
Range quadrants
Diesel parts
Propellor dolly assemblies
Tape and dies

Munitions

Guns
Pistols
Rifle parts
Howitzers
Gas masks

Electrical

Telephones and parts
Aircraft parachute flares
Radio headset, fire control instruments

Instruments

Instruments
Gages

RHODE ISLAND, VERMONT, MAINE

Women Available - Total 1/ -	Rhode Island 8,015	Maine 3,583	Vermont 2/ 1,201
Metal -	124	20	
Electrical -	207	1	
Chemical -	4	1	
Clocks, watches -	1,192	1	

1/ Excluding "unskilled."
2/ Details not secured.

Contracts Let Include (August 1940) -

Metal

Heavier Machines

Milling machine, screw machine
Chucking machine

Vermont - Screw machine
Lathes

Parts and Small Tools

Roller paths
Wire and related items
Wire staples
Tools, fixtures

Electrical

(none reported)

Instruments

Telescope mounts

CALIFORNIA, WASHINGTON, COLORADO

Women Available - Total 1/	California 19,077	Washington 2,932	Colorado 2/ 751
Metal -	103	20	
Electrical -	69	6	
Chemical -	3	6	
Transportation equipment	12	2	
Clock and watch	13	3	

1/ Except "unskilled."
2/ Details not secured.

Contracts Let Include (August 1940) -

Metal

Heavier Machines

California - Trainer assemblies
Cranes
Power trailers
Gate hoists

Washington - Boilers

Parts and Small Tools, etc.

California - Tools and equipment
Folding anchors
Gun sights, plane parts
Tube valves

Washington - Non-coconut charcoal

Electrical

Washington - Switchboards

Munitions

California - Cartridge cases
Demolition bombs
Fuses, bombs

Colorado - Machined shells
Shell forgings

TEXAS, LOUISIANA, OKLAHOMA

	Texas	Louisiana 2/	Oklahoma 2/
Women Available - Total 1/ -	9,656	1,617	1,428
Metal -	22		
Electrical -	7		
Chemical -	4		

1/ Except "unskilled".
2/ Details not obtained.

Contracts Let Include (August 1940) -

Heavier Metal
Texas - Diesel engines

Munitions
Louisiana - Machining shells
Oklahoma - Machined shells

ALABAMA, FLORIDA, GEORGIA, NORTH CAROLINA, TENNESSEE, VIRGINIA

Women Available

	Alabama	Florida	Georgia	North Carolina	Tennessee	Virginia
Total 1/	5,329	2,352	11,057	8,014	8,495	3,368
Metal -	10	9	31	14	57	11
Electrical -	3	1	26	6	16	3
Chemical -	1	2	1	6	30	2
Transportation equipment -	-	1	4	2	4	1
Clock and watch -	-	3	-	-	4	1

1/ Excluding "unskilled."

Contracts Let Include (August 1940) -

Metal

Heavier Machinery

Alabama - Air compressors

North Carolina - Trailers

Virginia - Boring mill

Parts or Small Tools

Alabama - Forgings

Munitions

Alabama - Machining shells

Georgia - Machining shells

Tennessee - Machined shells
Fuse, point detonating

3101

Federal Security Agency
SOCIAL SECURITY BOARD
Washington, D. C.

Pidgeon 8/22/41

Rec'd Fri Aug 22
MS Returned Sep 4
Called Mon Sep 8. Rept not yet available

10/3/41 To be released in 2 weeks
2 copies Requested - Jan 44.

11/24/41 not available for another month. Aug 21 1942 - not yet released.

1/17/42 - Not released.

For release in afternoon
newspapers of Thursday,
August 21, 1941
(861)

In an effort to promote employment of women workers in defense plants where shortages of male labor are becoming apparent, Federal Security Administrator Paul V. McNutt today announced that a study of 1,894 different occupations required in 21 key defense industries, revealed that a large majority are jobs in which women could be successfully employed, although they are not at present being hired for such work.

Only 331 of the nearly 1,900 kinds of jobs analyzed were found to be definitely unsuitable for women. The study, prepared by the Bureau of Employment Security of the Social Security Board, included the vital airplane, shipbuilding, and machinery industries, where widespread shortages have already occurred, as well as a number of other heavy production industries. An additional 47 occupations in these fields are already customarily filled by women exclusively or by either men or women.

The remaining ~~1,185~~ 1516 over - almost two-thirds of the total - were occupations in which the degree of physical strength required and the conditions under which the work is performed present no barrier to the employment of women. Moreover, 654 of the occupations in this group were of a kind in which women could be placed immediately, only a brief period of preparatory training, if any, being necessary.

Even in the case of the other ~~531~~ 862 occupations, for which considerable training is required, the Administrator pointed out that breaking up some of the jobs into their single-skill component parts would make possible the immediate employment of women. Down-processing of complex jobs to permit the employment and training, on-the-job, of semi-skilled workers has already been widely adopted by defense employers as a means of meeting skilled labor shortages.

Some of the occupations mentioned by the Administrator in which women could be employed were a wide variety of jobs in the manufacture and assembly of parts for motors, radios, recording instruments, and airplane gauges. He also stated that the development of new machinery now made possible the employment of women even in the manufacture of heavy shells and other types of munitions, whereas the method formerly used made it necessary to employ men only.

A large majority of the operations in the manufacture of automobiles, trucks, and tanks, even final body assembly, could also be performed by women, since heavy parts are moved by machinery.

A numerous list of occupations in the manufacture of parts for electrical equipment and in the operation of boring, shelving, welding, anodizing, cutting, drawing, sawing, stamping, and other types of automatic machinery used in the manufacture of machines and machine tools were also included in the list of acceptable jobs for women. In the ship and boatbuilding industry, women were listed as acceptable for employment as boilermakers helpers, draftsmen, machinists helpers, blueprint machine operators, flash welders, and a large list of other occupations.

Even in foundry work, it was found that women could be employed as casting cleaners, finishers, and polishers, as machine core makers, facing mixers, and in many other jobs. In the manufacture and servicing of aircraft, it was stated that women are competent in such work as metal fabrication, bench and stainless steel assembly, painting, covering, heat treating, anodizing, fusilage assembly, welding, and many other operations.

The industries covered by the survey were manufacture of aircraft and parts, air transportation and service, aluminum products, munitions manufacture, automobile, motorcycle, truck and tank manufacture, and equipment, communications, electrical machinery, firearms, industrial chemicals, iron and steel and their products, machine tools, machine models and patterns, foundries, professional and scientific instruments, railroad equipment, shipbuilding and repairing, utilities, and petroleum production and refining.

June 1941.

Women's Bureau
U. S. Department of Labor
Washington

PLANTS IN DEFENSE INDUSTRIES WHERE WOMEN ARE OR WILL BE EMPLOYED IN PRODUCTION 1/

	Product	Estimated number of Men	Estimated number of Women	Date of operation
Alabama				
Childersburg				
Coosa River Ordnance	bag loading	Some women will be employed		summer 1941
Colorado				
Denver Ordnance Plant	small arms ammunition	10,000	2,000	Fall 1941
Connecticut				
Bridgeport				
Remington Arms	small arms ammunition	3,000	1,800	Spring 1941
East Hartford				
United Aircraft	airplane engines	14,000	400	Spring 1941
New Haven				
Winchester Repearing Arms	small arms ammunition	7,800	2,500	Summer 1941
Stratford				
United Aircraft	airplane bodies	3,900	30	Spring 1941
Illinois				
Joilet				
Elwood Ordnance	shell loading	Some of the 6,000 will be women		Fall 1941
Indiana				
Charlestown				
Hoosier Ordnance	bag loading	1,950	1,800	Fall 1941
Indiana Ordnance	bag loading	6,950	1,800	Fall 1941
Kingsbury and Union Center				
Kingsbury Ordnance	shell loading	6,000	3,000	Fall 1941
Iowa				
Burlington				
Iowa Ordnance	shell loading	Some of the 6,000 will be women		Fall 1941
Missouri				
Lake City				
Lake City Ordnance	small arms ammunition	8,000	1,600	Summer 1941
St. Louis				
St. Louis Ordnance	small arms ammunition	Some of the 10,000 to 12,000 will be women		Summer 1941

1/ Includes all outstanding plants in shell loading, bag loading, Small arms ammunition, and fuses.
The Women's Bureau has visited aircraft plants in California, but at time of visit (Spring 1941) women employees in productive divisions were too small in number to be significant (less than 100 altogether in 6 major plants.

1/ (Continued)- nificant (less than 100 altogether in 6 major plants).

	Product	Estimated number of Men	Women	Date of Operation
New Jersey				
Dover				
Picatinny Arsenal	fuses, explosives	5,600	1,500	Spring 1941
Paterson				
Wright Aeronautical	airplane engines	some of the 15,000 will be women		Spring 1941
New York				
Buffalo				
Curtis-Wright corpotation	aircraft	11,370	35	Spring 1941
Ohio				
Ravenna				
Ravenna Ordnance	shell loading	5,000 - 6,000	2,500- 3,000	Spring 1941
Pennsylvania				
Philadelphia				
Frankford Arsenal	small arms ammunition, artillery parts, instruments	8,000	3,500	Spring 1941
Tennessee				
Milan				
Wolf Creek Ordnance	shell loading	some women will be employed		Summer 1941
Utah				
Ogden				
Ogden Ordnance	shell loading	1,000	1,000	Summer 1941
Virginia				
Pulaski				
New River Ordnance	bag loading	2,250- 3,000	1500- 2,000	Fall 1941

[Reprinted from The Woman Worker, bimonthly publication of Women's Bureau, U. S. Department of Labor, Washington, January 1941]

Women's Chances for Defense Jobs

INFORMATION as to job chances for women is much in demand, since many women seek effective ways to do their share in the defense program. Dr. Harriet Elliott, in charge of the Division of Consumer Protection of the National Defense Advisory Commission, advises those doing a job that contributes to the well-being of the people: "Go on with what you are doing, only do it better than ever before."

Jobs Are Found Through Employment Offices.

Defense jobs are filled by the Employment Service. Persons seeking placement in the defense program should register with the nearest one of the 1,500 full-time and 3,000 part-time local employment offices. These deal with all types of work, including manufacturing, clerical, and professional employment. The major requirements have been those of a mechanical and technical nature in which men are more likely to have experience, but many of which may be done by women.[1] Such offices can give information as to workers needed in other localities as well. The kinds of workers needed by these offices also would indicate the types of training called for.

Government Jobs.

Some civil-service examinations are being given for Government work. Information as to these can be obtained from the bulletin boards in 5,000 larger post offices, where Civil Service Commission announcements are posted telling the job requirements, pay, and how to make application. Many of these apply especially to men, frequently for the Navy (for example, marine surveyor, welding inspector, boiler inspector, glass blower). Examinations closed recently for stenographers, typists, bilingual stenographers, medical technicians, and punch-card operators. If these or others are opened, the notices will tell of it. Examinations for junior graduate nurse and for artistic lithographer are now open until further notice. There also have been examinations requiring highly technical or professional training of various kinds. The Department of Labor has advised, "Don't come to Washington unless the Civil Service Commission specifically asks you to. Most of these jobs are not in Washington, and just coming won't land a job for you."

Special Skills Required.

Very specific skills are required today, and persons, whether younger or older, who do not have such skills can find employment only by acquiring them. Training programs designed to give definite preparation in the kinds of work needed are discussed elsewhere in this issue of the WOMAN WORKER, and should be investigated through authorities *in the particular locality*. There is little *new* opportunity for women without definite skills, nor for those who have not worked recently, nor for those with other experience who desire to "get into industry," or to do some "defense" work. Management jobs, now as always, are relatively few for women and demand experience in industry, often in a particular industry. Camp hostess jobs are few—only about 100 in all, and 10,000 persons have applied for these. Age limits are 25 to 45 for junior hostess, 30 to 50 for senior. Applications are considered by the commanding general of each corps area.

[1] See articles on processes women perform (p. 6) and on conference on training (p. 4).

(Reprinted from The Woman Worker, Bimonthly Publication of Women's Bureau, U. S. Department of Labor, Washington, May, 1941.)

Women in the Labor Market in the States

PRELIMINARY census figures now issued estimate the total number of women in the labor market for the various States as well as for the country as a whole. These 1940 figures include job seekers with no experience, which is not the case with the 1930 figures for gainfully occupied persons. Hence the entire increase in woman-employment is appreciably less than the 20-percent increase shown from the number gainfully occupied in 1930 to the number in the labor force in 1940 would indicate. This also partly explains the fact that in most States, as well as for the country as a whole, these proportional increases among working women were greater than the increase in the woman population.[1] (Exceptions, States in which women had advanced more in population than in employment, are Alabama, Arkansas, Colorado, Georgia, Louisiana, Massachusetts, Mississippi, South Carolina, Utah, Washington.)

Increased Numbers of Women in Labor Market.

The figures so far available on employment are preliminary estimates from a 5-percent cross section of the complete data, and may be changed later. Comparison of the numbers of women in the 1940 labor market (including new workers) with the numbers gainfully occupied in 1930 shows the greatest increases in New York, California, Pennsylvania, Illinois, Texas, and New Jersey, adding respectively from 287,000 to 102,000 women workers. Over 50,000 were added in Michigan, Ohio, North Carolina, Florida, Virginia, and Missouri. The only State showing a decline in number of women workers was Mississippi, but in the following States the increase was so small that if the untrained youth were subtracted advance would be slight—Alabama, Nevada, Wyoming, Arkansas, Utah, Vermont.

[1] Comparisons throughout are of those 14 years of age and older.

Percent Women Are of All Workers.

The proportion of women among all the Nation's workers shows some increase, now being 24.3 percent while in 1930 it was 22 percent. In none of the various States was the difference from 1930 to 1940 greater than about 4 points, and it was as high as 3 points in only 8 cases, most of them not among the major industrial States—Delaware, Oklahoma, New Jersey, West Virginia, Florida, Nevada, Montana, and South Dakota. Declines in the proportions of the workers who were women were found in Mississippi, Alabama, South Carolina, and Arkansas, and only very small increases in Louisiana, Georgia, Colorado, Utah, Massachusetts, and Washington. These proportions are as follows in the 14 States leading in the employment of women, which have two-thirds of all the women workers in the entire country:

State [1]	Percent women were among— Gainful workers, 1930	All in labor market, 1940
New York	25.6	28.5
Pennsylvania	21.6	24.3
Illinois	22.5	25.3
California	22.3	24.8
Ohio	20.6	23.0
Massachusetts	29.2	30.6
Texas	19.0	21.9
New Jersey	24.3	27.9
Michigan	18.7	21.4
Missouri	20.5	23.2
North Carolina	23.8	25.9
Georgia	26.8	27.8
Indiana	18.8	21.3
Wisconsin	19.1	21.1

[1] Each of these States had over 258,000 women in 1940 labor market. Next State (Minnesota) 243,550. States are listed according to number of women in labor market.

Percent of All Women That Go To Work.

In general, the proportion of the entire woman population that now is in the labor market differs very little from formerly. In 1930, 24.3 percent of all women 14 and over were in gainful work; in 1940, 25.5 percent were in the labor market. The difference

probably is little or no greater than could be explained by inclusion of new workers in 1940 and their omission in 1930. In only one State, Delaware, is this difference considerable—28.4 percent in 1940 as against 23.9 percent in 1930.

In 10 States there actually were declines from 1930 to 1940 in the extent to which the women in the population had jobs or sought employment. Most notable of these was Mississippi, where 26.7 percent of the women were in the labor market in 1940 as against 32.3 percent gainfully occupied in 1930. Other States in a similar situation, though less extremely so, were Alabama, South Carolina, Louisiana, Arkansas, Colorado, Georgia, Massachusetts, Utah, and Washington.

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Women's Job Chances in Defense and Other Work

WOMEN are receiving a share of employment in the rapidly increasing defense industries. Visits made by a Women's Bureau agent in October and again in February to certain New England munitions and airplane factories showed that in some of these the force of women workers had increased by about 50 percent, in some it had doubled. In several plants combined, where some 2,600 women were employed in October, over 4,500 were at work in February. A plant being built for the manufacture of small arms ammunition in Kansas is expected to employ over 2,000 women; an Ohio munitions plant will absorb some 2,500 in the early summer. In Florida, women as well as men are to be considered for positions as aircraft fabric workers. In a Virginia plant to open in the fall, 1,500 or more women are to be employed in making bags, and sewing them closed after loaded with powder, the latter requiring great care to prevent accident and injury.

Places Increase for Women.

If the active file of individuals seeking jobs at public employment offices declines, it is a pretty good indication that workers are finding jobs. After June 1940, the active file declined steadily for the country as a whole, and by December its lists showed about 20 percent fewer women job hunters than in June. In the latter half of 1940 about 38 percent of all placements were those of women, though women constituted only about 24 percent of all persons in the labor market as reported by the Census.

Chances Outside Defense Industries.

While there has been much preoccupation with employment in defense industries, opportunities for the greatest numbers of women still lie largely in other fields. Men move into defense industries and women take the places of the men who move; or the well-trained woman may secure a defense job and another unemployed and perhaps less well trained may succeed to the job left.

The Bureau of Employment Security stated recently that from all over the country come reports of household help and farm workers obtaining employment in factories or arsenals. As a result, some shortages of farm and household workers have been reported. An analysis of 660,000 placements of women in the latter part of 1940 shows that of every 10 of these nearly 6 were in service occupations and 2 each in manufacturing and trade, with negligible proportions in agriculture, transportation, and so forth. Eighty-one percent of the service placements were in domestic work.

Women in Defense Occupations.

The Bureau of Employment Security is now reporting placements in a selected list of defense occupations, and gives this by sex. In these specific occupations data for 2 late months of 1940, when defense employment was advancing rapidly, show that women constituted only a little over 3 percent of all such placements through the offices, though many women had found jobs. No full record by sex of hirings at the plant gate is obtainable.

In the groups including the heavier industries, construction, transportation, and mining, as well as manufacturing, in the latter half of 1940 about 60 percent of the placements of men but only a little over 40 percent of those of women were in general labor occupations, while 10 percent of the women and 23 percent of the men were in occupations shown as the most skilled.

The two major industries for women were foundry and forge plants and electrical-goods manufacturing, in which were 75 percent of the women's but only 12 percent of the men's placements in the last 2 months of 1940. Most women placed in foundry and forge plants were operators of some type of press; a very few were core-makers. In electrical plants the great majority of women placed were assemblers, some were armature winders; a few assembled radio equipment or operated winding machines.

In two large groups that absorbed over 60 percent of men's placements, only 15 percent of those of women were found. One of these was in the machine-shop and machine-tool industries, where the largest proportion of women were drill-press operators, tool makers, and machine operators at benches; a very few were inspectors. The other industry was construction, where a very few women were placed as sheet-metal workers.

Other occupations in the defense list that absorbed a few women: Spray painter, jeweler, worker on final assembling in aircraft, upholsterer, and hand writer of signs.

(Reprinted from The Woman Worker, bimonthly publication of Women's Bureau
U. S. Department of Labor, Washington, July, 1941)

More Women Placed in Defense Jobs

DEFENSE jobs have called women to many tasks. These range from nursing, operating power sewing machines, or dietetic work, to assembling gas masks and doing fine precision work for airplane instruments. The Civil Service Commission has sent a letter to government agencies urging them to employ women rather than men wherever possible. Two questions asked repeatedly cannot be fully answered, though some indications can be given: One, How many women are being added to defense employment? the other, What new jobs are women doing?

There is no basis for arriving at the full numerical increase in woman employment, though the increases can be told for important scattered plants—too small a sample for a complete estimate. In fact, even the full increase during World War I is not known, though in a large sample of war implement and war instrument industries investigated by the Women's Bureau, women employees more than doubled in number from 1916 to 1918.

Defense Placements of Women Increase.

Total placements of women by public employment offices were declining in the early months of 1941, but women finding jobs in manufacturing were increasing somewhat. The Bureau of Employment Security makes special tabulations of placements in some 400 defense occupations, but only about 1 percent of all women's placements are in these jobs. However, such placements were more than three times as great in the early months of 1941 as in the late months of 1940.

Numbers of Women in Defense Jobs.

There are at least four sources of data on number of women employed, but none can give the complete picture as to how many are in defense jobs. Of course the number changes daily.

1. Census data by industry, when they become available, will show how many women worked in the spring of 1940 in industries that later developed defense production. The number since added to these is unknown, and the situation is constantly changing.

2. Reports of placements in defense jobs show only those made by public employment agencies, and there is no complete information on numbers hired at plant gates.

3. Indexes of employment trends are made from questionnaires sent out to employers. These are published, by sex, twice a year by the United States Department of Labor. They are the best available indications of the *trend*, but they are samples based on particular States and industries and hence show only the movement of employment and *not the complete numbers*.

4. Finally, there are scattered reports for important particular plants. These are based on occasional special investigations, and show nothing as to complete numbers except for those plants at the time investigated. However, they are very interesting and they indicate the situation. (See WOMAN WORKER, May 1941.)

Types of Work Women Are Doing.

Women's delicate workmanship and skill are a boon to defense operations, but the great numbers employed are in much the same kinds of factory work long done by women. Reports that women are driving taxis, or tending filling stations, do not mean the absorption of great numbers in such occupations. Where women are in jobs unusual for them they are relatively few, and in most cases have specialized experience or aptitude for the work.

Of women's placements in early 1941 in defense occupations listed by the Employment Service, 60 percent were in textile mills, most of them as yarn winders, frame spinners, weavers, slubbers, and throwers—traditional employments for women. Some were in electrical plants, as radio assemblers, or armature winders. A few were in less usual jobs, such as work at engine lathes,

milling machines, or as core makers, spot welders, or airplane coverers. Women are proficient at inspecting cartridges and polishing small parts for rifles, and in one plant they are reported as assembling, shaping, sharpening, testing, and chrome plating bandage shears for government use. Women work in rubber factories on the bullet-proof gas tanks—rubber lined and covered—so vital to life in aircraft, but here again the actual process is not unusual for women. They work also on silk parachutes, but the jobs consist of skilled cutting and sewing.

Women's Work on Airplane Parts.

In airplane assembly factories[1] women constitute a very small part of the productive labor force, thus far only a fraction of 1 percent, and their chief work is sewing. Of course, many do the usual types of clerical work in the plant offices. Reports of any appreciable number of women in "Aircraft plants" refer chiefly to the places *making the parts and accessories* for planes. Women are especially good at certain processes on airplane instruments, primarily the same types of work women long have done in electrical or other plants, such as coil winding, bench work, inspection, or assembly of delicate parts.

In assembly factories, the force of women could be considerably increased. One of the predominating jobs in the assembly of a plane is riveting, with its concomitant processes of drilling, counter-sinking, dimpling, and bucking. A large part of this work, though not all of it, might be done by women after a little training.

Much of the bench work on the simpler subassemblies could be done by women, and the skills required do not differ materially from those of women in many other industries. Women could do at least one-fourth of the inspecting, and in case of shortage of male workers considerably more. This refers to inspection of the parts, not to the floor inspection of the assembling of the plane. Inspectors usually advance after plant experience, and to do this work women would need considerably more experience than they have had.

[1] For further details see Women's Bureau multilith: Women's Factory Employment in an Expanding Aircraft Production Program. June 1941.

Need for Women Nurses and Doctors.

Women Army nurses have Army rating with proper rank and war-risk insurance. Not so the woman physician, though more than 2,500 are registered as qualified for national emergency service, about 500 of them willing to serve overseas. Medical societies in New York, as well as the American Medical Women's Association, are pressing for adequate rank for these women doctors if called to serve, but the American Medical Association recently refused to endorse this. In Great Britain 80 women hold commissioned rank in the Royal Army Medical Corps. Senior medical students graduating in 1941 from accredited medical schools are given the chance to gain commissions as first lieutenant in the Medical Corps Reserve. This should be open to young women as well as young men doctors. Other professional services engaging relatively small numbers of women are dental hygienists, therapy aides, and dietitians. The American Dietetic Association is seeking the rank of commissioned officer for members who go into Army service, now entailing danger without protection so that other fields are more attractive to trained women.

The need increases for nurses, both on the military and the civilian front. The following numbers have been asked for: Army Nurses Corps, 4,000; Veterans' Administration, 1,100; U. S. Public Health Service, hospital division, 200; Indian Bureau, 164. Nurses are needed in the Navy Reserve Corps, but the number is not stated. In 1940 there were 7,269 nurses in the Federal nursing services, an increase of 50 percent in 5 years. In civilian service there is need for supervisors and nurses to carry on health programs among students, and for "one-nurse" service in rural areas. Nurse technicians are needed in rural hospitals for work in anesthesia, X-ray, physiotherapy, and laboratory technique. It is estimated that 300,000 graduate registered nurses, chiefly women, now practice in the United States and its possessions

(Reprinted from The Woman Worker, bimonthly publication of Women's Bureau
U.S. Department of Labor, Washington, September, 1941)

Women's Part in Manufacturing for Defense

WOMEN'S work contributes largely to the labor force in many plants producing ammunition, explosives, firearms, instruments and small parts for aircraft, and other ordnance and defense products. Some of these are new establishments opened in the last 2 or 3 months, others have been under construction and will open in the fall, and many are older plants long in operation but now being expanded.

Data from a number of outstanding plants indicate the situation as to women's employment and types of work. A roughly estimated 12,000 women are or shortly will be doing shell-loading operations in Indiana, Iowa, Illinois, and Ohio in the Middle West, as well as in Utah and in Tennessee. A similar number of women are performing or soon will perform processes on small-arms ammunition in Colorado, Connecticut, Missouri, and Pennsylvania. Loading bags with powder or sewing such bags is a job for 5,000 to 6,000 women in Indiana, Alabama, and Virginia. Many women are at work on explosives in New Jersey, on airplane parts in Connecticut and New Jersey, on assembling radios for airplanes or other small assembly, and on aircraft instruments in New York, New Jersey, and Ohio. It is reported that some 2,000 women are to be employed shortly in a new ammunition plant in Des Moines, and that others will work in an expanded Texas ordnance plant.

Placements of Women in Defense Industries.

In the first quarter of this year women constituted well over a tenth of the workers placed by the public employment services in a selected group of 26 defense industries, according to recent reports from the Federal Bureau of Employment Security. This is a large proportion in view of the fact that many of these ordinarily are thought of as the heavier industries. Nearly a third of these placements were in jobs in iron and steel and machinery plants, and a proportion only slightly smaller were in electrical machinery establishments, which always have been large employers of women. In March, placements of women had increased 14 percent over February, those in the defense industries about 13 percent. Among all placements of women in that month 57 percent were in service industries, around 20 percent each in manufacturing and sales occupations.

Labor Shortages Call for Women Workers.

Shortages of workers are occurring in occupations more usually engaged in by women, as women are being drawn into manufacturing industries, sometimes with better pay or better conditions of work. Employment Service reports show a dearth of clerical workers in some places, of domestic workers in many localities (see p. 13 of this issue), and of sewing-machine operators in clothing centers. Experienced typists and stenographers are so much in demand by the Federal services that examinations now are kept open continuously until further notice.

Among shortages reported by the Employment Service in 78 defense occupations, one type was such as to call for women—that of detail assemblers in aircraft, in which there were demands for 50 workers for every 1 registered. Workers most in demand included aircraft riveters. This is a predominating job in the assembly of airplane parts, and a large proportion of it can be done by women, especially if a short period of training is provided.

Though primary demands have been for men and for the younger persons, the need for workers has tended to relax arbitrary restrictions such as those against married women or against older workers, if they have some needed special skill. A recent example among many is that of a large southern textile plant that has lifted its customary ban on married women. That the future may call for more women with experience or ability to serve in executive capacities is indicated by the fact that an official of a

large rubber company has predicted that more women will be needed for supervisory work in office forces.

Women Making Ammunition for Small Arms.

Women constitute a large proportion of those making ammunition for use in small arms. Women are about 40 percent of the workers in a large arsenal that tends to establish standards for this industry, according to a recent report of the Women's Bureau.[1] This proportion could be increased considerably. Many of the plants now being built, as well as expansions in existing plants, will produce such ammunition. The demand is almost unlimited, as can be seen from the fact that a single airplane can fire at least 160 rounds of ammunition a second from each of its 8 or more machine guns.

Women work on .30- and .45-caliber bullets, both ball (for use against persons and light targets) and armor piercing. Men work on larger bullets and on tracer bullets, which have a compressed igniting charge that gives a bright flame or trail of smoke, and are used for observation and incendiary purposes. Women do the assembling, that is, putting the core into the jacket. They also operate machines for pointing or nosing the jacket, inserting the slug, and finishing operations.

The primer, which is to be inserted in the cartridge case, is a little brass cup that contains the pellet charge, a small explosive wafer pressed to a foiling disk; this is placed in the cup under a tiny anvil through which the flame from the ignited pellet passes into the vent hole in the cartridge case to ignite the powder. Women shellac the foiling paper and operate a machine that presses it over the primer. They place the small anvils in the primer cups, a hand operation. They inspect the finished primers.

Women are employed on various operations in making the cartridge case, and in loading it. After the brass case is formed, women operate special horizontal spindle machines that trim its top, and other automatic machines performing several processes in perfecting the case, and in inserting the propellent powder and the bullet. There are many inspection operations covering each stage of the processing of the various parts, and these often are women's jobs, as is much of the packing of the finished product.

[1] See Women's Bureau multilith, Employment of Women in Manufacture of Small Arms Ammunition. June 1941.

(Reprinted from The Woman Worker, bimonthly publication of Women's Bureau
U.S. Department of Labor, Washington, November 1941)

Defense Program Increases Need for Women Workers

WOMEN'S work now is in real demand in defense industries and in other occupations from which workers have gone to defense employment. Agencies concerned with labor supply are examining processes to discover the types most suitable for women. At the same time, the picture is marred by certain dislocations due to changes from civilian to defense production.

Employment Service reports as early as last spring stressed the fact that women's chances for jobs continued to improve, and that already women were being taken on in places vacated by men. Indicative of this shift are the reports from various parts of the country of labor shortages in work ordinarily performed largely by women, such as skilled textile operators, experienced office workers, restaurant employees, sewing-machine operators, salespersons, and workers in all types of service occupations. Employees, many of them women, also have been needed in seasonal industries such as canning, agricultural operations, apparel manufacture, and service in resort hotels.

Labor Needs That Women Can Fill.

A detailed study of labor demands in major branches of the airplane industry made by the United States Bureau of Labor Statistics shows that in particular jobs that women in very many cases could fill, over 50,000 workers will be required by the late fall, additional numbers later. For much of this work women would need training. From surveys made by the Women's Bureau it would appear that chief jobs suited for women are as operators of various types of presses, as subassemblers in sheet metal, riveters, benchworkers (including burring and filing), inspectors, and clerical workers (including stock clerks). Other possibilities include different kinds of welding, and operating lathes, milling machines, and other metal-processing machines. A similar study of needs in the machine-tool industry shows more than 3,000 forthcoming jobs that women might fill, chiefly as operators of machines, such as drill presses, lathes, milling machines, and so forth, as inspectors, and clerical workers.

Side by side with evidences of increased opportunities for women are currents hostile to women's chances. Where women are replacing men, this has been to some extent in lower-paying types of work. Some employers through the country still prefer men or boys outside the draft ages. One example of many is a new arms plant in New York State requiring over 1,800 workers largely on processes that women could perform, but men are preferred. Special organizations are being set up to assure jobs for the men being released from their first period of army service; there will be a continual stream of men leaving as well as going into training, and these men undoubtedly will be given job preference over women who have done the work in the interim. Shifts from industries being converted from consumer to defense manufacture also cause great hardship to women, as in the spectacular instance of silk mills, where there are indications that over half of the 75,000 women in the industry lost their jobs.

Women Continue To Be Placed in Jobs.

Employment Service reports of placements of women in all types of occupations showed much the same picture from month to month throughout the spring and early summer, and may be outlined as follows: (1) On the whole, increases continue; (2) service jobs still absorb nearly 60 percent of the women's placements, manufacturing around a fifth; (3) very roughly a third of the placements in manufacturing go to women.

Placements in manufacturing increased by 10 percent in May over the preceding month. Large scale hirings in the electrical industry, in which a third of all workers are women, were reported in

Middle Atlantic States even as early as last spring. Many thousands of women should find factory jobs in three large midwestern cities before next spring, according to estimated needs. Ammunition, arms, machinery, and ordnance plants in various parts of the country were taking on women as their forces were enlarged or as their male labor supply was being reduced. Examples are:

Massachusetts—Women as bench hands in an arms factory.

Rhode Island—Women on various operations in a plant making a new type of wire for field use by the Signal Corps; and women in greatly increased numbers on assembly, bench, and press work in jewelry factories making army insignia (though there are other reports of women losing their jobs in jewelry plants).

Connecticut—Over 200 women inspectors in one plant and a shift of women solderers in another.

Maryland—400 Negro women assembling gas masks.

Ohio—1,500 women to make ammunition parts.

St. Louis—3,000 women in an arms ammunition plant.

Western New York—About 800 women taken on in a large ammunition plant.

Some experiments are being made with women's work in aircraft plants, and a large California firm has pioneered in putting on 300 women.

Of women's placements in a special list of defense jobs over an 8-month period, nearly half were for some type of press operation. A fourth were in assembly, chiefly in electrical and radio plants, but in a few cases for aircraft. An appreciable number also were inspectors. The largest group of industries into which these women went were in metal work, the next in machine-shop and machine-tool plants; third came electrical manufacturing, with almost as many in foundries and forgings.

Women Given Training in Many Localities.

Employers consider more seriously how best they can train and install new divisions of women, or use these workers to replace men no longer available, and many plants are experimenting with women on new jobs. Scattered evidences of changes in processes in order to employ women range from textile mills to fine-instrument making.

Reprinted from THE WOMAN WORKER, bimonthly publication of Women's Bureau
U. S. Department of Labor, Washington, September 1940

Women Who Can Work in Defense Industries

PROBABLY not far from 2 million women are immediately available for defense work, according to preliminary and conservative estimates covering women actively seeking work through the Employment Security Agency and those now on W. P. A. rolls. Almost a sixth of these already have the necessary skills or at least some experience, enabling them to adapt themselves easily.

There is a large additional group who have only partial employment and would be available for further work. Indicated by the 1937 Census of Unemployment as at least half a million, this probably is not an overestimate for the present.

Well over a quarter of a million of the unemployed women are possessed of skill, according to a recent preliminary report of the Employment Security Bureau. Of this group of skilled women, 34 percent are in the Middle West; 22 percent in the Middle Atlantic States (excluding New York [1]); 20 percent in New England; 14 percent in Southeastern States; and 8 percent in the Far West (excluding California [1]) and the Southwest.

Figures reported by the W. P. A. show more than 300,000 available women on projects in May 1940. Many of these have had experience with machines. Last December about 17,000 women were at work on power machines in sewing projects.

In addition to those unemployed and on W. P. A. work, there are large but indefinite numbers of women now at work on jobs less skilled than they are accustomed to who could quickly be called back to their more skilled occupations.

Women do much of the skilled work in the manufacture of certain textiles and clothing needed in a defense program, and as these expand, large numbers of women can be used. According to United States Bureau of Labor Statistics figures, women comprise the following proportions of skilled workers:

	Percent
Knitted outerwear	76
Hosiery (full-fashioned)	52
Knitted underwear	30
Boots and shoes (not rubber)	22
Cotton goods	21

This group includes the following occupations that were listed as skilled:

In cotton manufacture—Smash hands, weavers, and hand drawers-in.

In shoe making—Machine cutters, binding stitchers, padding or soft-shoe stitchers, top stitchers, all-round stitchers, and vampers.

In hosiery mills—Loopers, seamers, toppers, menders, and miscellaneous knitters.

In knitted-underwear plants—Cutters, hand and machine knitters, and loopers.

Long experience with women in industrial employment shows that there are certain types of work that women perform particularly well. They excel in work requiring care and constant alertness, good eyesight, and use of light instruments such as gages, micrometers, vernier calipers—work calling for little physical exertion. These are characteristics of such jobs as inspection of castings, machinings, and finished parts, of routine powder analysis, of testing electrical equipment.

Women excel at work requiring manipulative dexterity and speed, but which permits them to set their own tempo and to work in a sitting position. These are characteristics of bench work calling for laying-out work for machine operators, operating very small machines to finish small and irregular parts, assembling delicate instruments and machines, loading shells, filling powder bags. They also are expert at work requiring skill but little strength either in handling parts or in setting up machines. These are characteristics of drilling machines, lathes, milling, grinding, and polishing machines operating on small parts. Women operate large machines on heavy work when lifting devices and pneumatic chucks can be used.

[1] New York and California were the only two major industrial States not included in this preliminary report, which covered 33 States.

SUPPLY OF WOMEN CAN SWELL DEFENSE LABOR RANKS

As long as there are millions of women outside the usual labor force who can be drawn into defense employment, hours of work certainly need not be lengthened. Moreover, excessive work hours actually reduce production, as has been proven over and over in industrial experience here and in England and elsewhere.

Thus an available woman labor supply can help to maintain the standards already reached for reasonably short hours of work, and at the same time to keep up production standards. Indeed the present outlook shows a potential labor supply in numbers well in excess of such need as is on the horizon.

The number of women that can be called on may be estimated in several different ways, and might easily range from some 2 million to some 7 or 8 million, with the ultimate possibility (short of extreme emergency) probably being more nearly 5 to 6 million women under 45 years of age.

This number does not refer to those who could be newly recruited within any single year. Moreover, it would presuppose considerable inducements to some of these women to enter defense work. With women, as with men, the more capable workers requently are the more difficult to secure. Even 8 million women subtracted from the present reserves would leave 15 million more (aged under 45) still at home or in other civilian pursuits involved in maintaining the life of our 131-million population.

Women of 45 and over are not counted into the estimates suggested here, for it may be assumed that about as many of these as newly entered employment would, for one reason or another be retiring from the labor market.

How quickly could defense need call out the service of these women? Nearly half a million of them would be new workers in the labor market or else employed in the emergency-work program, and so far as readiness to accept a job is concerned these could be placed as quickly as required.

A recent statement of O.P.M. signifies that 2 to 5 million more workers would be required in defense plants within a year. The need through 1944, as estimated by the National Resources Planning Board, would be only about 8.2 million additional persons, 6.5 of them as workers (the remainder in the army).

Since there are over 5 million workers officially classified as unemployed, this estimate would show somewhat over 5 million more as needed by 1944. By that time the supposition is that production programs probably would require few new workers per year, and might even be beginning a sharp contraction. And still no account is taken of available men and women who are now working only part time, new workers, and the fact that many workers will postpone retirement during the emergency. Add, too, the fact that in the months prior to estimates culminating about now, the number of workers actually on jobs did not increase as much as it had been thought they would. Only 2½ to 3 million workers a year could be added according to the N. R. P. B. just quoted, with a possible 4 million in a maximum year.

The Bureau of Labor Statistics estimates that those defense contracts which already were authorized by about mid-1941 would require 19 million "man-years" of work, including the 4 million then employed on defense work. However, much of this is to be spread over several years, in some cases 9 or 10 years, so that even with additional contracts the possible labor force would not be overstrained. At any rate it is highly conservative to say that

available women added to other available workers (men and the underemployed) would much more than take care of the requirement, without any lengthening of hours, and would do so even if the production of some of the individuals should be somewhat below that now considered customary.

So much for quantity of labor, but what about quality? What about necessary skills? Obviously, men and women who do not have these must be given training, and this at once, since learning the more skilled work is bound to require time. Side by side with such a program goes the extension of two other moves that long have been in progress in planning for greatest industrial efficiency: (1) The splitting up of some of the more skilled processes so that persons with less training can perform the work and (2) The grading upward of workers as fast as their experience and ability enables them to do a more complicated job.

The more social aspects of the labor supply question have been left out in the foregoing discussion. Two serious types of dislocation in the labor market already are coming to the fore. Lay-offs are occurring due to defense priorities or to shortages of materials, causing an extensive shifting of the workers into new jobs, with the hardships of more or less intervening unemployment. The second dislocation arises from the return of men from the army, which will occur in a continual even if decreasing stream. Many of them will go back to their old jobs, which will mean displacement or shifting of the workers who have carried on this work in the interim; of the other returning men, some will go into newly created jobs, but many will not, and placement of these will cause a further rearrangement of the labor force.

POPULATION AND EMPLOYMENT OF WOMEN IN 1940

		Millions of Women in 1940 -	
		Aged 14 - 44	Aged 14 and over
Population		33.2	50.3
Labor Force		10.1	12.8
Employed	8.7		
New Workers	.3		
On "emergency" work	.5		
Others seeking work	.8		
Not in Labor Force		23.1	37.5

If 1.6 million of these now have been put to work (1941 figures to August), this about balances the women new, "emergency", and seeking workers in 1940, and leave still not in the labor market nearly 23 ~~.4~~ million women 14 to 44 years of age.

ESTIMATES OF AVAILABLE WOMAN-POWER

It is at this point that speculation begins as to how many of these 23 million women can be recruited for defense labor.

The proportions of women in the population who were in the labor force in 1940 or were in gainful work in 1930 were as follows:

	Percent of the Women of -	
	14 - 44 years	14 years and over
1940 (Labor Force)	30.4	25.5
1930 (Gainful workers)	27.9	22.0

Assuming similar proportions of the now non-employed to be available, 5 to 7 million women could be called on, as the following shows:

Assumed to be Available		Millions remaining not in labor market
Percent of those not in labor market	Millions of women	
30.4	7	16
25.5	6	17
27.9	6.5	16.6
22.0	5	18.1

A British estimate that of the total woman population about 50 percent could be employed would give 6.5 to 8.5 million available, leaving about 16½ million still outside the labor market.

ADDITIONAL NOTES ON LABOR SUPPLY AND DEMAND AFFECTING WOMEN

I Wage-Hour Division

Statement by Fleming, October 11, 1941.

There are between 5 and 6 million persons officially classified as unemployed.

There are another 2 to 3 million women not so classified who could be swung to defense work.

II Federal Security Agency

1. Statement by McNutt, October 11, 1941.

Since the beginning of 1941, there have been 3½ million placements by public employment offices, 54 percent more than in the same period last year.

In August 1941, there were 509,700 jobs filled through the offices.

2. April 1941 Count of those seeking jobs -

Included 1.1 million women.

Of these 50 percent were "skilled, semiskilled and unskilled", almost 60 percent sought sales or service jobs (the remainder scattered).

	Millions of women	
	Total	Under 45 years
Total seeking jobs	1.1	.9
"Skilled, semi-skilled and unskilled"	.53	1/ .26
Sales and Service	.66	1/ .55

NB from the above

1/ Assuming the same distribution for those under 45 as for total. So far as defense work is concerned, this is conservative, since more of the older women are likely to be in the sales and service group.

3. Report of October 14, 1941.

Close to ½ million workers are expected to be hired in 26 defense industries in the last half of 1941, according to estimates of some 10,000 employers.

Nearly 2/3 of these will be in California, New York, Michigan, Pennsylvania, and Ohio.

About half these jobs will be in aircraft and shipbuilding; another fourth in iron and steel and nonelectrical machinery.

III Office of Production Management

1. Statement by Hillman, September 17, 1941 (Release, PM 1167)

	Millions
New jobs created and filled, first year of defense -	4
Needed in addition by April 1942 - - - - - - - - - - -	2.5

If 10 to 25 percent 1/ of these were women:

	Millions		Millions
First year - - - - -	.4	to	1
By April 1942 - - -	.25	to	.6
Total - - - - -	.65	to	1.6

2. An Earlier Estimate (April 1941) showed:

Still unemployed and seeking work by 1942 - 2 million workers (This corresponds with the National Resources Planning Board Estimate)

This estimate includes as the number to be recruited from among housewives, farm labor, and students - 5 million workers.

1/ 10 percent is the proportion women are of employment service placements in defense industries; 24.3 percent is the proportion women are of all persons in the labor force, 1940; 54.3 is the proportion women are of operatives and kindred workers in manufacturing in the State so-far reported for 1940 that has the large number of such employees, (N.H.).

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

LABOR SUPPLY

Source: Problems of Labor Supply for War Production, Zurich Insurance Companies, Industrial Welfare Department, 135 South La Salle Street, Chicago, Ill. Sept. 1942. p. 13

. . . According to the War Manpower Commission, the nation has a backlog of 13 million women in the homes, age 14 to 65, who have no children under sixteen and are not now gainfully employed. In addition there are 9,800,000 more housewives with one or more young children. Many of these could work, as they do in other countries, if nursery schools were provided for their children.

The Industrial Relations section of the Department of Economics at Princeton University analyzes our available woman power for war work and predicts the the following classifications of women will be called:

500,000	of the 4,400,000 students under 18
1,100,000	of the 9,300,000 over 45
2,500,000	of the 4,900,000 under 45 years with no children under 10
1,100,000	of the 8,700,000 with children under 10

This is in addition to the 6,700,000 farm women who must stay where they are. . . . .

WOMAN LABOR RESERVE
November 1942

An estimated 5,000,000 nonworkers constituted the Nation's labor reserve that was immediately available on a voluntary basis to meet the manpower shortage in November 1942, according to the Bureau of the Census. Women made up 4,500,000 of this reserve and 4,100,000 of these were housewives. The 500,000 available men were mainly students, or older men not ordinarily in the labor force because of age or physical restrictions. This labor reserve of 5,000,000 nonworkers who could take full-time employment was, of course, in addition to the estimated 1,700,000 workers who were reported as unemployed in November.

Most of the 4,500,000 women in the labor reserve were married and keeping house, and about one-third were responsible for the care of small children. Among both men and women, over three-fourths were willing to accept factory employment, while nearly one-sixth would take farm jobs. Three-fourths had previous work experience, but little more than half of these had worked within the past five years. The problem of bringing workers and jobs together is indicated by the fact that less than one-fourth of those who could take jobs were willing to move to another community. Most available workers did, however, indicate an interest in factory training programs and a willingness to work at prevailing wages.

NONWORKERS WHO COULD TAKE FULL TIME JOBS
14 years of age and over

	Total	Women	Men
	In millions		
Total	5.0	4.5	0.5
Engaged in home housework	4.1	4.1	*
Students	0.5	0.3	0.2
Unable or too old	0.2	*	0.2
Other nonworkers	0.2	0.1	0.1
14 - 19 years		0.3	
20 - 24 "		0.4	
25 - 44		2.0	
45 - 64		1.3	
65 years and over		0.1	
Inexperienced		1.2	
With work experience		3.3	
Within last 5 years		1.7	
More than than 5 years		1.6	
Farm		0.8	
Nonfarm		3.7	
		Percent	
Not responsible for care of children		60	
Responsible for 1 or more children under 14 years		40	
" " " " " " " 10 "		22	

* Less than 50,000

Oct. 1942

DEMANDS FOR WOMEN

10-13-42

United States - Mobilization of Labor Power.

The National Industrial Conference Board has collected statements from employers regarding their problems of labor power. The number reporting is not given. The following quotations are statements of executives regarding women.

Automotive - At the present time nearly 1/3 of our total employees are women, which is an increase from about 22% a year ago . . .There are many complex problems arising from the use of women on male classifications.

Clothing - We are beginning to fill jobs previously done by men with women, who are highly satisfactory; we feel, however, that it will be increasingly difficult to obtain additional women workers in this industrial community.

Construction materials - We are now using more women than we have in the past, find them very effective on operations they can handle.

Electrical equipment - Additional women workers can be mobilized and trained in order to avoid a decline in production. . .The demand for women workers will be so great in this locality that it is doubtful whether there will be anything like a sufficient number to answer the requirements.

Food - Since January 1, 1942, the turnover ratio for men has doubled; for women it has tripled . . .Labor turnover has been increasing and I believe that one of the greatest causes has been that of women leaving industry to take up household duties.

. . . . . .

Woman workers are now operating with high effectiveness. . .We are prepared to inaugurate a training program for additional women employees whenever that becomes necessary.

Foundries - We are planning to use women wherever we can but are inclined to believe it will be difficult in a foundry to place enough women to offset the shortage of men. . .Although we have never employed women in the foundry, we expect to make provision to substitute about fifty women for fifty men within the next six months. They will be employed for light coremaking and as laboratory technicians.

Hardware and Plumbing Supplies - Although women workers are used to some extent in lighter operations they do not fit into the real work of our foundries.

Heavy Machinery - Women workers are being trained to do a great many jobs formerly done by men; this trend should increase.

DEMAND FOR WOMEN (continued)

Machine Tools - Our observations are that women are doing good jobs. . . It will be a serious change if we do have to train women for shop work since our production is all heavy machines, but I think it can be done in time.

Metal Products - In some cases, the women workers may not be operating quite as effectively as the men did but the over-all picture shows them to be quite satisfactory especially if they are over 20 years of age. . .We have found that female workers operate very effectively in our organization.

Office Equipment - We are putting on more and more women workers all the time.

Rubber - We have doubled the number of women employees in the past 6 months and probably the number will be increased. . . . Women workers are now operating effectively in our organization.

Steel - We have already embarked on a campaign to employ more women in positions which up until now have been considered sacred to men.

Textiles - We are now doing everything we can to obtain additional women employees properly trained to carry on the work. . .Better than one-third of our workers are now women and they are handling effectively the jobs which they are filling.

(The Conference Board Economic Record, September 1942.)

NOTE: No material can be used without specific written permission of the National Industrial Conference Board.

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Source: Problems of Labor Supply for War Production, Zurich Insurance Companies, Industrial Welfare Department, 135 South La Salle Street, Chicago, Ill. Sept. 1942. p. 16

. . . . A large rubber factory found that provision of tables and chairs on a job formerly done standing up made it possible for 16 girls to do the work of 20. In a metal working plant, women machine operators hired to replace men complained of "congestion in the pelvic region" due to the strain required to reach the foot pedals. The trouble disappeared when special "standing-sitting" stools were installed. Such stools were also responsible for a 32% increase in output when they were recently introduced in an electrical supply factory. . . .

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Source: Problems of Labor Supply for War Production, Zurich Insurance Companies, Industrial Welfare Department, 135 South La Salle Street, Chicago, Ill. Sept. 1942. pp. 20-21.

Supervision

Most employers report that women "take" readily to supervision because they are normally more suggestible and socially minded than men--and, in the main, are more conscientious and loyal. Many employers report that frequently women need less supervision than men.

As to whether the supervisor should be a man or a woman, opinion differs widely as it does in so many other problems of human relations. There is apparently no rule to follow other than plain common sense under the specific circumstances.

The British Ministry of Labour claims that the right type of woman is a better supervisor than the best male because she knows the peculiar quirks of the female mind, is more sympathetic to their problems--remembering her own difficulties as a beginner--and is an inspiration to the girls who see living proof that they too may some day succeed to promotion. A sensible compromise has been adopted in several U. S. war plants where it was found that efficiency in output is better when foreladies are used as first-line supervisors under the general direction of the top foremen. This relieves the skilled foreman for more important duties and leaves to the forelady such routine matters as the immediate adjustment of minor grievances and attention to safety regulations.

Women are found to fit in quickly and easily when placed side by side with men in "mixed" departments, but work disruptions and other difficulties sometimes occur when women are first put to work in a few all-female departments. . . .

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

Source: Problems of Labor Supply for War Production, Zurich Insurance Companies, Industrial Welfare Department, 135 South La Salle Street, Chicago, Ill. Sept. 1942, pp. 27-28.

Older Worker.

. . . Certainly it is not a matter of studying the average man over 40, but rather of assaying, in terms of the job to be done, such highly individual factors as heredity, early environment, education, accidental injuries, disease, standards of living, habits of work and recreation, medical care, responsibilities. Dr. E. J. Steiglitz, eminent authority on senescence, in warning employers against confusing chronologic age with physiologic age (for they are not the same) says this: "Generalities concerning babies are far more justified than for the same individuals 40 years later when each has accumulated a highly personal set of experiences, infections, intoxications, and mental actions and reactions."

Several studies of output by age groups have been made in automobile manufacturing, which show that the highest piece-work earnings have come in the 50 to 55 age bracket. Similar studies in the textile industry indicate no tendency for output and earnings to diminish materially before age 60.

A goup of doctors at the Harvard Fatigue Laboratory find the assumption that there is a rapid decline after 40 in quantity and quality of work "a social myth grossly inconsistent with the evidence." Summarizing many studies made in this field, these scientists conclude: (1) The rate of decline in workers' capacities after 45 has been greatly exaggerated. (2) Evidence relative to changes in the abilities of older workers must be considered in trms of the particular set of circumstances. There is at present little reason for taking the position as a ground for action that in general men over 45 are less efficient.

Are They More Prone to Accidents and Illness?

Studies of the accident statistics for older workers show considerable variation. Hood Rubber Co., one of the most reliable analysts of employee disability records, has reported that both the frequency and severity rates rise rapidly for workers in their organization over 40 years of age. The American Medical Association, in an article by Dr. Steiglitz of the United States Public Health Service, reports that, "The fact has been confirmed statistically that the frequency rate of industrial injuries dimishes with age, though the severity rate rises slightly." Another study, made of 5,000 workmen's compensation cases in the steel industries of New York and Wisconsin by the United States Bureau of Labor Statistics, shows the highest accident frequency in the 20 to 24-age group--due apparently to youth's impatience, inexperience, and light-hearted willingness to take a chance. But the severity rate went up with age to a total of 2½ times the 20 to 24 rate for workers age 50 to 59. This experience was closely borne out by a comprehensive study of the experience of the Swiss National Accident Insurance Fund in 1930 to 1934. . . .

Labor INFORMATION BULLETIN

JULY 1942

Factory Employment and Pay Rolls

Further gains in employment and pay rolls in manufacturing industries were registered in May. Factory employment, according to the index of the Bureau of Labor Statistics, was 37 percent above the 1923–25 level and total weekly wage disbursements were 92.6 percent larger than the average of the 3-year base period 1923–25.

UNITED STATES DEPARTMENT OF LABOR

Labor Force in the United States

The total population of the United States as revealed by the 1940 Census reached approximately 131,700,000, an increase of 8,900,000 since the preceding census in 1930. Of the 101,100,000 persons 14 years of age and over, slightly more than one-half (52,800,000) were found to be in the "labor force" of the country.

Among those classified as "labor force" the Census included persons actually at work; those with a specified job, although not working during the week of March 24–30, 1940, when the census was taken; those seeking work; and those employed on public emergency projects, such as W. P. A. It also included persons seeking work who had no previous work experience.

About 44,000,000, or 83.4 percent of those included in the labor force, reported that they were at work in private or nonemergency Government services during the week of March 24–30, 1940. An additional 1,121,000 persons indicated that they were not actually at work but had jobs, businesses, or professional enterprises from which they were temporarily absent. These two groups combined comprised the employed portion of the labor force and totaled 45,200,000. They included 33,700,000 persons working as employees for wages or salaries, 9,800,000 persons who operated their own business enterprises or farms, and 1,400,000 unpaid workers who assisted on farms or in stores or other enterprises operated by members of their families.

Nearly 5,100,000 persons were reported as seeking work and without any kind of public or private employment during the census week. Eighty-five out of every one hundred men and women in this group stated that they had previous work experience. The remainder were new workers who had never had a full-time job lasting 1 month or more.

Urban and Rural Distribution.—Of the approximately 52,800,000 persons included in the labor force, about 32,600,000 (61.8 percent) lived in urban communities—cities and incorporated places of 2,500 or more inhabitants. The remaining 20,200,000 workers resided in rural areas. Of these, nearly 10,500,000 persons lived on farms and 9,700,000 lived in villages or other nonfarm areas.

Birthplace and Race.—White persons born in the United States totaled 41,400,000, or about 78 percent of the Nation's labor force in March 1940. Foreign-born white persons aggregated 5,800,000, or 11 percent of the total. Negroes totaled 5,400,000, or about 10 percent of the labor force. Other nonwhite races in the 1940 labor force amounted to only 231,000 or less than one-half of 1 percent of the total.

Sex Distribution.—About 3 out of every 4 workers included in the labor force were men. They aggregated slightly more than 39,900,000, as compared with slightly more than 12,800,000 women. The proportion of employed men was slightly smaller than for women—85.2 percent of the men as against 86.7 percent of the women. More men than women were employed on emergency work projects. The census revealed that 5.2 percent of the men were on W. P. A. and other emergency work, as compared with 3.6 percent of the women.

Persons Not in Labor Force.—Slightly more than 48,300,000 persons or 47.8 percent of the total population of the United States 14 years and over were reported as not in the labor force at the time of the 1940 census. This number included about 28,900,000 persons doing work in their own household and 9,000,000 who are attending school. It likewise included nearly 5,300,000 persons unable to work, 1,200,000 inmates of institutions, and approximately 3,900,000 persons who for one reason or another were not working or seeking work or whose employment status could not be determined by census interviewers.

It is from this large group of persons, which includes 37,700,000 women and 10,600,000 men classified as "not in the labor force," that most of the additional workers needed by the war emergency will have to be drawn. Most of the men in this category, however, were those either unable to work or who were in institutions, and boys and young men in school. It is therefore the women in this group that constitute by far the largest potential source of new workers who can be drawn into the war effort. This is particularly true of the women engaged in their own housework, who numbered about 28,700,000.

Employment status of persons 14 years old and over in the United States

[Sixteenth Census of the United States: 1940]

Group	Country as a whole—			Urban areas of 2,500 population and over—		
	Total	Male	Female	Total	Male	Female
Total population (all ages)	**131, 669, 275**	**66, 061, 592**	**65, 607, 683**	**74, 423, 702**	**36, 363, 706**	**38, 059, 996**
Persons 14 years and older	**101, 102, 924**	**50, 553, 748**	**50, 549, 176**	**59, 690, 675**	**28, 918, 796**	**30, 771, 879**
In labor force	*52, 789, 499*	*39, 944, 240*	*12, 845, 259*	*32, 613, 669*	*23, 007, 458*	*9, 606, 211*
Employed (excluding public emergency work)	45, 166, 083	34, 027, 905	11, 138, 178	27, 592, 567	19, 278, 267	8, 314, 300
At work	44, 045, 137	33, 222, 418	10, 822, 719	26, 877, 607	18, 787, 552	8, 090, 055
With a job	1, 120, 946	805, 487	315, 459	714, 960	490, 715	224, 245
On public emergency work	2, 529, 606	2, 072, 094	457, 512	1, 418, 235	1, 110, 033	308, 202
Seeking work	5, 093, 810	3, 844, 241	1, 249, 569	3, 602, 867	2, 619, 158	983, 709
Experienced workers	4, 326, 469	3, 381, 881	944, 588	3, 046, 177	2, 297, 380	748, 797
New workers	767, 341	462, 360	304, 981	556, 690	321, 778	234, 912
Not in labor force	*48, 313, 425*	*10, 609, 508*	*37, 703, 917*	*27, 077, 006*	*5, 911, 338*	*21, 165, 668*
In own home housework	28, 931, 869	267, 125	28, 664, 744	16, 082, 551	151, 310	15, 931, 241
In school	9, 013, 342	4, 593, 630	4, 419, 712	5, 135, 419	2, 637, 174	2, 498, 245
Unable to work	5, 268, 727	2, 966, 225	2, 302, 502	3, 096, 120	1, 663, 891	1, 432, 229
In institutions	1, 176, 993	767, 474	409, 519	488, 836	298, 853	189, 983
Other and not reported	3, 922, 494	2, 015, 054	1, 907, 440	2, 274, 080	1, 160, 110	1, 113, 970

The Order of Employing Women in War Plants

July 1942 issue

The Women's Bureau of the U. S. Department of Labor has developed a definite policy as to priorities that should be observed in the employment of women workers if this country's labor force is to be most effectively used. This should be applied at the present time, and may be further developed as the situation changes. The Women's Bureau recommends:

1. First women to be employed should be those with factory experience who have lost their employment because of priorities in materials and plant adjustments to war production.
2. Then, other unemployed women who are registered with the Employment Service seeking work.
3. Next, if necessary, the more than 800,000 girls coming from high schools and colleges.
4. Women caring for their homes, particularly those with small children, should not be asked to go into factories and workshops until it is absolutely necessary. They can be much more helpful to the Nation by staying in the home and taking care of the children. It is recognized that in some cases these women find it necessary to work, and for them some provision must be made.

Employment of women in war plants doubled from the time of the Pearl Harbor attack to the spring of this year, and will be more than doubled again by the fall. But offsetting these are the women losing jobs because of shortage of materials or the transfer of plants to war production. For this reason the numbers on Employment Service rolls did not decline though numbers employed increased so rapidly. For example, it was estimated recently that 150,000 workers on women's clothing were jobless. Three-fourths of the workers in this industry were women. At the same time another 30,000 workers on men's clothing—where nearly three-fourths were women—were out of jobs in the New York area alone. Shortage of steel needles, as well as of materials, had earlier affected the sewing trades.

Efforts are being made to convert available consumer-goods plants to the manufacture of gas masks, tents, leggings, work jackets, first-aid kits, and other light war materials. However, it was estimated by the New York Department of Commerce that if consumer industries in that city were cut 10 percent, war industries existing there would have to be expanded 56 percent to maintain normal employment.

In full-fashioned hosiery, centering to a large extent in Pennsylvania and North Carolina, a major proportion of the 59,500 women workers were affected by silk shortages. Through vigorous combined efforts of Government, labor, and

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industry to place these workers, some found employment in parachute or munitions making, but this could not take care of all. Many of the 17,500 women who were in silk-throwing and spinning mills and 7,000 making silk fabrics also lost their jobs.

The jewelry industry employed over 14,000 women before its metal materials were curtailed. Plants shifted to producing cap and collar insignia, cases for instruments, and small parts for bullets, but by late spring in one of the chief jewelry States a major proportion of the displaced women had not been reemployed and probably could find jobs only with great difficulty.

Another industry whose employees have similar unemployment problems is the making of games and toys, which employed over 10,500 women. Carpet and rug making, with its 9,500 women workers, has been hard hit. It is an industry not easy to convert to a war basis, and the skills of its employees could be transferred to other work only with difficulty. The leather-glove industry, employing over 7,000 women, expects sharp curtailment when its stocks of leather are exhausted this fall.

It is workers such as these who should first be drawn upon in filling the new and increasing war demands. Reports of New York employers expecting to take on women by the autumn of 1942 indicate an increase of women in airplane plants, operating drilling machines, lathes, power sewing machines, using filing, boring, riveting, and welding devices, and on the assembly line; in plants making lenses, bomb sights, precision instruments, and fire-control apparatus, working as assemblers, grinders, honers, drill-press operators, solderers, cementers, welders, engravers, polishers, testers, and inspectors. Other women will turn out radio tubes and parts, work at radio repair; or they will be employed, chiefly up-State, in the electrical-machinery industry as assemblers, winders, inspectors, power-press operators, and X-ray technicians. Some of these firms will use women as core makers and turret-lathe operators.

Though the need for women workers has increased markedly, the major call for them still is in the future. Less than a third of the expected hires in war plants in the first half of 1942 were to be in establishments that would take women in the types of jobs open, according to reports to the United States Employment Service from over 12,000 such plants. Largest numbers of anticipated openings were in making ammunition, aircraft, and electrical machinery. In such an important industrial State as New York, 1,400 employers reporting in April expected women to constitute only about one-fifth of the workers they would take on by the autumn of 1942. The male labor supply still was so large this spring that over 1,100 of these employers did not plan to include any women in their new labor forces before the fall.

Women in Michigan War Industries

In Michigan, an important war-production State, the reservoirs of woman power had not been appreciably tapped in the late spring. A survey of more than 900 manufacturing establishments by the Department of Labor and Industry showed only 13 women to every 100 men employed. At the same time women were a still smaller proportion of the workers in major war industries—only 3 to 6 percent of all those in factories making automobiles, aircraft and parts, automobile parts, and foundries and machine shops.

Alive to the fast-coming need for more women in war industries, a union of automobile workers recently held a women's defense conference in Detroit. A resolution was adopted asking for an extensive training program for women. It was suggested that women with industrial experience should be trained before inexperienced women. The conference called for the use of idle plants and facilities for training purposes, and the payment of trainees from Federal funds. Nearly 30,000 women were employed in the automobile industry before the present rapid conversion to war production.

In the main women were being hired for jobs unattractive to men, according to the survey by the Department of Labor and Industry referred to; women's earnings ranged from 11 to 61 percent less than men's in the same industries. In the aircraft industry women's earnings were 33 percent less, in automobiles nearly 38 percent, in agricultural machinery 61 percent.

The Michigan legal requirement that where women do the same work as men they shall be paid the same rate has been upheld by the courts in a recent decision following several years of litigation. More than $55,000 in back pay was awarded to 29 women, who had been paid only 76 cents an hour while men on similar work had received 97 cents. The judge dismissed as "not material" testimony by the company that 15-minute rest periods were given women workers in the morning and afternoon, which the men did not have.

Because war-production plants are hiring women for the first time, Commissioner of Labor John W. Gibson issued on June 17 special regulations based on provisions in the law regarding their employment. This again illustrates the fact that women work more effectively where conditions are healthful and otherwise satisfactory. The regulations are as follows:

1. Women shall not be required to remain standing constantly, and seats must be provided.

2. Women shall not be required to lift more than 35 pounds in the course of their regular work, nor shall they be required to carry more than 20 pounds while ascending stairs.
3. Women shall be prohibited from doing any type of overhead lifting or stacking.
4. Women shall be prohibited from employment in foundries, except in core rooms.
5. Women shall not be employed in handling the following substances or in the following operations unless ventilation and working conditions are approved by the department: Lead, benzene, carbon disulphide, and mercury; arc welding and dry-grinding wheels.
6. Women's dressing rooms and first-aid stations shall be furnished with a bed or cot.
7. Women shall not be employed in any other type of employment disproportionate to their strength or in any way detrimental to their morals, health, or potential capacity for motherhood.
8. No employer shall discriminate in any way in the payment of wages between male and female employees in the manufacture or production of any article of like value either on piece work or on a time basis.

The Commissioner said he strongly recommended that women be required to wear proper safety clothing, that they have morning and afternoon rest periods of 15 minutes' duration, and that they be provided sanitary lunchrooms. These regulations followed conferences with representatives of employers, labor, the United States Department of Labor, the Employment Service, and similar interests.

Case Stories Show Value of Hours Standards

While the labor commissioners have been cooperative in granting variations from laws when necessary for war production, most of the administrators also recognize that labor standards play a constructive part in maintaining long-term output. Case stories from different States prove this point.

Commissioner Forrest H. Shuford of North Carolina writes that ". . . most of the contractors engaged in the construction of Army and Navy camps advise me that they have now gone on a 6-day week. Some of them have stated that the practice of working men 7 days a week was very unsatisfactory and did not get the results which had been anticipated . . ."

Commissioner Howard E. Armstrong of Vermont tells the story of a plant operating on a three-shift schedule, 7 days a week, 8 hours a day. A change in the working schedule to allow each shift 1 day off out of 7 reduced lost time 50 percent, while full time production was maintained.

Field Director Maud Swett of the Department of Woman and Child Labor in the Wisconsin Industrial Commission cites this example to show the importance of meal periods to production: The Industrial Commission in the case of one concern operating under emergency conditions granted permission for a reduction of the meal period to 15 minutes on condition that the employer keep a record of production for every 2-hour period, for a 2-months' trial. Before the 2 months were up, the company reported that their records showed lessened production as a result of the shorter lunch period. As a result of this experiment the company put its entire plant, including the men, on a half hour meal period.

Experience in Pennsylvania is of particular interest since the law in that State sets a maximum 44-hour week for women, a standard equalled in only one other State. The law also authorizes the Industrial Board in the Pennsylvania Department of Labor and Industry to make variations from it "* * * when the strict application of the schedule * * * imposes an unnecessary hardship * * *"

Meeting at the State Capitol shortly after Pearl Harbor, the Industrial Board decided that employers playing an active part in the war program might be permitted to employ women over 21[1] beyond the limits of the hours law—*but not more than 48 hours or 6 days in any week.*

The Bureau of Women and Children and Hours and Minimum Wages in the Department of Labor and Industry issues permits for work up to 48 hours when the request appears to be justified. and the Bureau of Inspection subsequently investigates the plant to verify statements made in the requests. Using 48 hours as a standard has meant that the State has not had to deny many applications. The payment of time and one-half is required under the State law after 44 hours whether or not the firm is subject to the Fair Labor Standards Act, which, of course, requires time and one-half after 40 hours.

Has Pennsylvania found that holding to a 48-hour standard impedes the war effort? Evidently the 1942 legislature did not think so, since it failed to pass any of the four bills which would have taken exemption authority away from the Department of Labor and placed it in other hands. Evidently most of the manufacturers in the State do not think so, since they have found that through the use of multiple shifts they can run machines around the clock, still keeping to the 48-hour standard for women.

To make possible multiple shift operation, the department has issued permits for work beyond 10 p. m., the night-work limit which the Women's

[1] The Board later reduced this age limit to 18.

Hours Law prescribes. The number of these permits issued indicates the number of Pennsylvania firms employing women on night-shift production: permits for the employment of women on the second shift had been issued as of June 1 to 173 firms; on the third shift, to 100 firms.

One official from the head office of a firm that has plants all over the country points out that he prefers the Pennsylvania procedure to that of some other States which have granted extensions beyond 48 hours. The Pennsylvania system, he says, has encouraged multiple shift operation, while in some other States his head office has had difficulty persuading local managers of the wisdom of three-shift operation, when they could secure permission to employ women on one or two shifts for more than 8 hours a day.

The Bureau of Women and Children and Wages and Hours investigates all plants requesting night-work permits. When the inspection cannot be made before the exemption is granted, a temporary permit based on Bureau of Inspection records is issued, pending investigation. The bureau requires that if women are to be employed at night the plant must provide adequate supervision and lunchroom facilities, and transportation must be available.

During the past months the department has granted permits to allow a 48-hour week for women and multiple-shift production to firms producing aircraft and ammunition parts, shroud lines for parachutes and parachute cloth, tanks, ball and roller bearing, and many other materials vitally needed for the war effort.

Good Labor Relations—Greater Production

Aeronautical Lodge 727, International Association of Machinists, with its union chairman training program at the Lockheed-Vega plant, offers a concrete example of labor relations geared to war production.

To make sure that its collective bargaining agreement will be administered smoothly, the Lodge has worked out for its 1,375 union chairmen a training program which the management thoroughly endorses. As part of this program the union has published a chairmen's manual explaining the agreement and its administration.

The training program of this union differs from others in several noteworthy respects. The material to be used in the training of shop chairmen was checked in the course of preparation with the management to insure mutual agreement. The union president will conduct the training course and will at some points invite a representative of top management to appear with him and to discuss certain matters from both union and company points of view. And the company may use some of the same materials in conducting training courses for its own officials.

Lodge 727 called on the technical services of Government in the preparation of its manual. A representative of the Division of Labor Standards worked with union and management officials in translating the terms of the agreement into the kind of situations that actually arise in the plants, in showing what decisions on individual cases would be in line with the agreement, and in putting the legal and complicated language of the agreement into everyday English.

The promotion of smoothly functioning industrial relations through full understanding of the terms of the collective bargaining agreem t is a tremendously important job for the unions in the battle of production. Consequently the story of what Lodge 727 has done is well worth repeating.

The mushroom growth of the aircraft industry has meant that many of this Lodge's 30,000 members are new to the union, many company and union officials new on the job. Many of the leadmen and group leaders are not used to having supervisory authority and sometimes not fully familiar with the work they are supervising. The manual published by the union stresses the part union chairmen must play in working with supervisory officials in the administration of the agreement, telling them that "* * * The number of planes going to our forces in Australia and Alaska and other far flung outposts is partly your responsibility, and if you perform your duties efficiently, industrial relations will proceed smoothly and production will climb."

The manual explains very carefully how wage matters and grievances are handled. It discusses several ways in which union chairmen can contribute to the welfare of union members and to greater production for victory. For example, it stresses the importance of working safely and urges union chairmen to discourage and halt demoralizing rumors, to become leaders in building high morale and encouraging greater war production.

The manual is practical and good looking. As amendments are made to the agreement or as other changes become necessary the manual can be easily revised, as it is in loose-leaf form. The style is clear and dignified, yet readable, while the general make-up is such that a person could find what he wanted in the manual without delay.

The union is also starting classes for shop chairmen to instruct them in the use of the manual, in the history and background of the union, and in the general principles of organization.

Earnings in Industries Manufacturing Machinery

To provide basic information on the effects of the war on industrial products, technical processes, occupational patterns, and the wage structure, the Bureau of Labor Statistics has undertaken a series of studies of establishments manufacturing machinery and allied products. This article summarizes data on employment and earnings in industries manufacturing agricultural machinery and construction machinery. Similar reports on mining, textile, oilfield, and miscellaneous industrial machinery will be summarized in a later issue of the Bulletin.

I. Agricultural Machinery

Conversion to war production was not far advanced in the agricultural-machinery industry at the time of the survey of the Bureau of Labor Statistics in February and March 1942. The late start in conversion was due largely to the obvious necessity for providing farmers with sufficient machinery to plant, cultivate, and harvest their crops.

Data obtained from 55 establishments show that the more than 12,000 wage earners in this industry were paid on the average 84 cents an hour for a workweek of nearly 41 hours. This compares with prewar (August 1939) average earnings of nearly 70 cents and a workweek of 38 hours.

On the average, the largest plants paid the highest wages. For example, in the 8 establishments which employed more than 250 workers, hourly earnings averaged 91½ cents, as compared with 54 cents in 25 plants each employing 50 wage earners or less. The existence of most of the large agricultural machinery plants in the North accounts also for a substantial part of the wage differential of 26 cents an hour which was found to prevail between plants located in the North and those located in the South.

Among the various occupations, skilled drop-hammer operators were the highest paid group of workers, averaging $1.10½ per hour. Screw-machine operators earned nearly $1.10 per hour, and buffers and heat treaters, slightly more than $1.08 per hour. Eleven other occupational groups also averaged $1 or more per hour. About 8 percent of the workers, principally helpers and laborers, were employed on jobs paying less than 60 cents an hour. The lowest average (51 cents) was reported for molders' helpers.

Union Organization.—Of the 55 agricultural-machinery plants surveyed, 16 operated under union agreements negotiated with national labor unions—8 with unions affiliated with the A. F. of L., and 8 with unions affiliated with the C. I. O. Four additional plants had agreements with independent labor unions which had no national affiliation. Most of the largest plants in the industry operated under union agreements. This is indicated by the fact that although less than a third of the plants surveyed reported the existence of an agreement with a union covering wages and working conditions, nearly 70 percent of all the workers were covered by such agreements.

II. Construction Machinery

The 41 plants included in this survey constituted about one-fourth of the total number of plants in the industry. As a result of the war, output of 14 plants during 1941 consisted of products with high priority ratings, and during the early part of 1942, 5 establishments reported their entire output as closely connected with the war.

Employment of approximately 11,350 workers in these plants during the period February–April 1942 was almost twice as great as just preceding the outbreak of the war in 1939. Over this same period average hourly earnings, including overtime payments, rose from about 69 cents to 90½ cents, and hours of work advanced from about 38½ to 50 per week.

Almost two-thirds (64 percent) of the workers included in the Bureau's sample were employed in 6 large plants. These wage earners earned on the average 93 cents an hour during the late winter or early spring of this year. By contrast, average hourly earnings in 14 plants each employing fewer than 50 workers amounted to about 75½ cents.

Nearly a fifth of the slightly more than 7,000 male workers earned $1 or more per hour. With the exception of working foremen, who earned $1.12½, pattern makers and tool and die makers were the highest paid among the large occupational groups, each averaging $1.09½ per hour. Other numerically important groups of workers averaging more than $1 an hour included floor assemblers, hand welders, and turret-lathe operators. With the exception of apprentices, only 3 jobs—core makers' helpers, foundry laborers, and watchmen—showed average hourly earnings below 60 cents. These workers constituted only about 2 percent of the total.

Union Organization.—Nineteen of the forty-one plants were operating under union agreements at the time of the survey. Fourteen of these agreements were with nationally affiliated unions. In most instances these agreements covered employees in the larger establishments manufacturing construction machinery.

Employment and Pay Rolls in May 1942

An increase of 327,000 workers between mid-April and mid-May brought the total number of civil nonagricultural workers in the United States

to a new all-time high of approximately 41,200,000. This exceeded the previous employment peak of December 1941 by 128,000. It was also about 2,300,000 higher than in May of last year.

Greater activity on Government construction projects resulted in the hiring of 92,000 more workers in May and brought the level of employment in contract construction above any month since the fall of 1929. Other large increases in employment included 86,000 in Federal, State, and local Government agencies, 40,000 in transportation and public utilities, and 38,000 in financial, service, and miscellaneous establishments. The mining group of industries also recorded a small gain in employment, but wholesale and retail stores reduced their labor force slightly.

Manufacturing.—Durable-goods industries added slightly more than 100,000 workers to their pay rolls during May. This increase was partly offset by a decline of about 27,000 in nondurable-goods employment. The result was a net employment gain over the month of 75,000 factory wage earners.

For the first time since last November, automobile plants, which have been converting their facilities to war production, showed an increase in employment. Shipbuilding, aircraft engines, machine tools, and other war industries continued to report sharp employment gains. On the other hand, shortages of materials and lay-offs in plants converting their facilities to war production reduced the level of employment in a number of industries, including cast-iron pipe, cutlery, radios, typewriters, carpets and rugs, and rubber goods.

Federal Service.—Employment in the Federal executive service increased by 78,700 in May to a total of 2,091,000. About 6,400 persons were engaged in the legislative branch, and 2,700 in the judicial branch during the month.

Construction Projects.—Employment and earnings on construction projects financed wholly or in part from Federal funds in May were:

Work Relief Programs.—Contraction of various Federal work relief programs continued during May. Employment on projects operated by the Work Projects Administration totaled 786,000 or 80,700 below the preceding month. Fewer workers were also employed by the National Youth Administration and the Civilian Conservation Corps. Since May 1941, employment on all work relief programs has declined by slightly more than 1,350,000.

Project	Employment	Earnings
All construction projects	1, 564, 500	$281, 540, 000
Regular Federal Government appropriations	1, 465, 000	265, 850, 000
Reconstruction Finance Corporation	61, 100	9, 900, 000
Public housing authority	33, 800	5, 300, 000
War Public Works	4, 400	460, 000
Public Works Administration	200	30, 000

Hours of Work and Earnings in Manufacturing Industries

Employment in all manufacturing industries averaged 42.5 hours per week in May. This was, on the average, about the same as in April and over 1.5 hours per week longer than in May a year ago. Hourly earnings of 83 cents averaged slightly more than in the preceding month and 12½ cents an hour more than in May 1941. The average weekly wage income of factory workers in May of $37.40 was 80 cents per week higher than in April and $6.60 per week higher than in the same month of last year.

For all durable-goods industries combined, workers averaged 45.0 hours per week in May and earned 92½ cents an hour and $43.35 per week. Workers in nondurable-goods industries averaged 40.0 hours of work per week, 72 cents an hour, and $28.35 per week. In 10 selected industries weekly hours and hourly and weekly earnings in May were:

Durable-goods manufacturing

Weekly hours:
- 48.5 in foundries and machine shops.
- 47.5 in aircraft.
- 41.0 in blast furnaces and rolling mills.
- 40.5 in sawmills.
- 39.0 in brick manufacturing.

Hourly earnings:
- $1.00 in blast furnaces and rolling mills.
- $0.98 in aircraft.
- $0.91 in foundries and machine shops.
- $0.70 in brick manufacturing.
- $0.62 in sawmills.

Weekly earnings:
- $45.80 in aircraft.
- $43.90 in foundries and machine shops.
- $40.90 in blast furnaces and rolling mills.
- $27.10 in brick manufacturing.
- $25.10 in sawmills.

Nondurable-goods manufacturing

Weekly hours:
- 42.5 in paper and pulp.
- 41.0 in cotton-goods manufacturing.
- 40.0 in slaughtering and meat packing.
- 38.0 in boots and shoes.
- 38.5 in petroleum refining.

Hourly earnings:
- $1.10 in petroleum refining.
- $0.80 in slaughtering and meat packing.
- $0.77½ in paper and pulp.
- $0.65 in boots and shoes.
- $0.53 in cotton-goods manufacturing.

Weekly earnings:
- $42.10 in petroleum refining.
- $32.95 in paper and pulp.
- $32.00 in slaughtering and meat packing.
- $24.85 in boots and shoes.
- $21.75 in cotton-goods manufacturing.

Estimated employment and pay rolls in manufacturing industries

[May 1942, April 1942, and May 1941]

Industry	Number of workers employed			Amount of weekly pay roll		
	May 1942 [1]	April 1942 [2]	May 1941	May 1942 [1]	April 1942 [2]	May 1941
All industries [3]	**10, 814, 000**	**10, 739, 200**	**9, 861, 100**	**$365, 440, 000**	**$354, 136, 000**	**$273, 404, 000**
Durable-goods groups [3]	*5, 869, 800*	*5, 767, 700*	*5, 057, 600*	*233, 978 000*	*224, 388, 000*	*163, 406, 000*
Iron and steel	1, 202, 000	1, 206, 900	1, 186, 000	47, 637, 000	46, 098, 000	40, 920, 000
Machinery	1, 772, 600	1, 750, 200	1, 438, 900	78, 091, 000	75, 137, 000	51, 770, 000
Transportation equipment	1, 418, 200	1, 332, 900	967, 500	69, 192, 000	64, 726, 000	37, 350, 000
Nonferrous metals	359, 700	359, 500	348, 900	13, 842, 000	13, 645, 000	10, 940, 000
Lumber	670, 300	668, 400	680, 100	16, 565, 000	16, 062, 000	14, 281, 000
Stone, clay, glass	329, 500	334, 200	335, 000	9, 329, 000	9, 326, 000	8, 683, 000
Nondurable-goods groups [3]	*4, 944, 200*	*4, 971, 500*	*4, 803, 500*	*131, 462, 000*	*129, 748, 000*	*109, 998, 000*
Textiles	1, 819, 200	1, 843, 300	1, 832, 400	41, 044, 000	40, 847, 000	34, 983, 000
Leather	319, 200	325, 000	309, 100	7, 876, 000	8, 077, 000	6, 355, 000
Food	901, 200	882, 500	846, 900	24, 382, 000	23, 207, 000	20, 428, 000
Tobacco	88, 200	89, 100	89, 800	1, 654, 000	1, 643, 000	1, 493, 000
Paper and printing	633, 100	643, 100	641, 700	19, 637, 000	19, 798, 000	18, 571, 000
Chemicals	518, 900	526, 100	450, 500	18, 583, 000	18, 478, 000	13, 719, 000
Rubber	127, 200	127, 900	142, 900	4, 674, 000	4, 518, 000	4, 464, 000
Unclassified	537, 200	534, 500	490, 200	13, 612, 000	13, 180, 000	9, 985, 000

[1] *Preliminary.* [2] *Revised.*

[3] *Major groups adjusted to 1939 Census of Manufactures. Because the subgroups have not been similarly adjusted, and because of overlapping, the totals of the subgroups under durable goods do not agree with the total for the group as a whole.*

Employment, Pay Rolls, Wages, and Hours in Selected Nonmanufacturing Industries

Item	May 1942 [1]	Increase or decrease	
		April 1942 to May 1942	May 1941 to May 1942
Retail trade		*Percent*	*Percent*
Employment	3, 607, 400	−0. 1	−2. 0
Weekly pay roll	$82, 308, 000	+. 3	+2. 6
Weekly hours	41. 5	−. 4	−2. 3
Hourly earnings	$0. 61	+. 6	+6. 9
Weekly earnings	$23. 10	+. 4	+4. 7
Wholesale trade			
Employment	1, 463, 800	−1. 7	−1. 2
Weekly pay roll	$53, 198, 000	−. 4	+8. 6
Weekly hours	41. 5	+. 4	+. 4
Hourly earnings	$0. 85	+1. 1	+8. 8
Weekly earnings	$35. 05	+1. 3	+9. 9
Bituminous coal			
Employment	428, 000	−. 3	+6. 1
Weekly pay roll	$13, 541, 000	+3. 4	+18. 5
Weekly hours	33. 0	+3. 0	+7. 3
Hourly earnings	$1. 06	+. 6	+5. 1
Weekly earnings	$34. 75	+3. 8	+11. 7
Metal mining			
Employment	90, 200	+. 1	+6. 3
Weekly pay roll	$3, 309, 000	+1. 8	+23. 8
Weekly hours	44. 0	+. 9	+5. 2
Hourly earnings	$0. 88	+. 8	+10. 7
Weekly earnings	$38. 55	+1. 7	+16. 4
Telephone and telegraph			
Employment	459, 800	+. 1	+7. 8
Weekly pay roll	$15, 721, 000	+2. 0	+12. 8
Weekly hours	40. 0	+. 7	[2]
Hourly earnings	$0. 83	+1. 3	+4. 8
Weekly earnings	$33. 35	+1. 9	+4. 6

Item	May 1942	Increase or decrease	
		April 1942 to May 1942	May 1941 to May 1942
Power and light		*Percent*	*Percent*
Employment	241, 500	−1. 0	−4. 6
Weekly pay roll	$9, 434, 000	−. 2	+3. 4
Weekly hours	40. 5	+. 3	+. 8
Hourly earnings	$0. 97	+. 8	+7. 4
Weekly earnings	$39. 15	+. 9	+8. 4
Street railways and busses			
Employment	205, 400	+1. 6	+6. 3
Weekly pay roll	$8, 081, 000	+2. 8	+19. 3
Weekly hours	47. 5	+. 8	+2. 8
Hourly earnings	$0. 80	+1. 0	+9. 6
Weekly earnings	$38. 70	+1. 2	+12. 3
Hotels			
Employment	279, 000	+. 4	−. 8
Weekly pay roll	$4, 711, 000	+1. 6	+8. 1
Weekly hours	45. 0	−. 4	+1. 0
Hourly earnings	$0. 37	+1. 6	+7. 9
Weekly earnings	$17. 10	+1. 2	+9. 0
Laundries			
Employment	263, 000	+3. 2	+5. 2
Weekly pay roll	$4, 958, 000	+4. 9	+15. 4
Weekly hours	43. 5	+. 3	−. 1
Hourly earnings	$0. 49	+1. 4	+9. 6
Weekly earnings	$20. 90	+1. 6	+9. 8
Dyeing and cleaning			
Employment	74, 900	+5. 4	+6. 0
Weekly pay roll	$1, 636, 000	+7. 3	+18. 0
Weekly hours	44. 5	[2]	−. 9
Hourly earnings	$0. 56	+1. 0	+12. 6
Weekly earnings	$24. 65	+1. 8	+11. 3

[1] *Preliminary.* [2] *No change.*

Cost of Living in June 1942

Living costs in large cities rose 0.4 percent between June 2 and June 15, after a drop of 0.1 percent in the 2 weeks immediately following the General Maximum Price Regulation. Prices of unregulated goods and services advanced 1.2 percent in the 2 weeks' period from June 2 to June 15, while prices of controlled goods declined 0.1 percent. Between May 15 and June 15 uncontrolled prices advanced 2.4 percent, while controlled items declined 0.8 percent. The most important advances have been in the prices of uncontrolled foods.

Prices of foods not under the General Maximum Price Regulation advanced by an average of 4.8 percent between mid-May and mid-June. Controlled food prices on the other hand showed an average decline of 1 percent. Total food costs to city families rose, therefore, 1.3 percent between May 15 and June 15. This increase represents about the same average rate of advance as that which occurred during the 14 months prior to the beginning of general price regulation on May 18. Fresh fruits and vegetables, lamb, and poultry (none of which are subject to price control) led the rise in prices between mid-May and mid-June.

Clothing prices, all regulated, dropped 0.7 percent between May 15 and June 15, on the average in the large cities. In spite of the fact that all articles of housefurnishings are subject to price control, prices of housefurnishings rose, on the average, 0.1 percent between May 15 and June 15, as the result of price increases in a few stores in some cities. In some cases these changes were due to a return to the March level after sales in May.

Sharp declines in rent required in a few large cities by the Office of Price Administration caused the average for large cities of the country to decline 1.3 percent between May 15 and June 15 to a point 0.4 percent below that of mid-March.

Cost of Living in 21 Large Cities

Area and city	Index as of June 15, 1942 (1935–39=100)	Percentage change		
		Mar. 15, 1942 to June 15, 1942	June 15, 1941 to June 15, 1942	Aug. 15, 1939 to June 15, 1942
Average for 34 cities	116.4	+1.8	+11.3	+18.1
North Atlantic:				
Boston	113.9	+2.1	+11.1	+17.3
Buffalo	120.9	+2.6	+12.7	+22.7
New York	114.2	+2.0	+9.3	+15.4
Philadelphia	114.9	+2.0	+11.2	+17.5
Pittsburgh	116.9	+2.7	+11.1	+18.8
South Atlantic:				
Baltimore	119.2	+2.1	+12.6	+20.8
Savannah	120.2	+1.5	+14.5	+21.0
Washington, D. C.	115.5	+1.8	+11.9	+17.1
North Central:				
Chicago	116.3	+2.3	+11.0	+17.8
Cincinnati	116.8	+2.1	+12.4	+20.0
Cleveland	118.4	+1.5	+11.5	+18.4
Detroit	117.9	+.6	+10.8	+19.7
Kansas City	114.1	+1.1	+12.1	+15.7
Minneapolis	115.9	+1.4	+9.8	+16.2
St. Louis	116.6	+1.6	+12.0	+18.9
South Central:				
Birmingham	116.9	−.3	+10.8	+18.7
Houston	115.7	+.3	+11.2	+14.9
Western:				
Denver	115.7	+2.3	+12.4	+17.3
Los Angeles	118.6	+1.8	+12.3	+18.0
San Francisco	117.9	+1.9	+11.9	+18.7
Seattle	119.3	−.3	+11.3	+18.9

Hours, Overtime, and All-Out Production[1]

State Administrators Uphold Policy on State Hours Laws

Labor commissioners from leading industrial States met on July 8, 1942, with the Secretary of Labor and representatives of the Army, the Navy, and the Maritime Commission to review the experience of the last 6 months in administering State labor laws under war conditions. The conference reiterated its support of the statement of policy on State labor laws issued by the Secretary of Labor on January 27, 1942, concurred in by the War and Navy Departments, and pledged its full cooperation in the war production program.

The conference reported that the policy for temporary adjustment of labor laws to meet emergency conditions is proving effective in meeting bottleneck situations and has served to maintain the sound labor standards that are essential for maximum war production. The procedures developed by the States in meeting emergency situations are functioning to the satisfaction of the procurement agencies in securing war materials. The conference recommended that the United States Department of Labor continue to serve as a clearing house between the State labor departments and Federal agencies on matters connected with relaxation of State labor laws which cannot be settled locally.

States represented at this conference were Connecticut, Delaware, Illinois, Kansas, Massachusetts, New Hampshire, New York, North

[1] *This section continues the series of articles on State experience in the administration of hours laws during wartime, started in the April 1942 issue of* Labor Standards.

Carolina, Ohio, Pennsylvania, Rhode Island, Virginia, and Wisconsin.

States Report on Variations Granted

State labor departments each month have been sending to the Division of Labor Standards, United States Department of Labor reports of action on applications for variations from hours laws for war production. The following table summarizes these reports from December 7, 1942, to June 1, 1942. Most of the permits have been issued for short periods to enable the industry to train new help and supervisors to man additional shifts.

Action taken by reporting States on applications for variations from hours laws for war production December 7, 1941–June 1, 1942

State	Total number of variations		Number of variations, by types [x indicates no law for adults]											
			Maximum hours for women and minors			Night work					1-day-rest-in-7			
						Second shift		Third shift						
	Granted or renewed	Denied or withdrawn	Granted or renewed	Denied or withdrawn	Number in effect June 1, 1942	Granted or renewed	Denied or withdrawn	Granted or renewed	Denied or withdrawn	Number in effect July 1, 1942	Granted or renewed	Denied or withdrawn	Number in effect June 1, 1942
Arkansas [1]	1	------	1	------	0	x	x	x	x	------	------	------	------
California	48	21	10	19	1	4	------	30	------	33	4	2	
Colorado	3	------	3	------	0	x	x	x	x	------	x	x	0
Connecticut [2]	126	9	49	6	23	41	1	36	2	77	------	------	------
Delaware	7	------	1	------	1	1	------	5	------	6	------	------	------
Indiana	55	2	x	x	------	15	------	40	2	55	x	x	------
Kansas	15	------	4	------	3	7	------	4	------	11	------	------	------
Maine [1]	1	------	------	------	------	x	x	x	x	------	1	------	1
Minnesota	5	------	5	------	3	x	x	x	x	------	x	x	------
Nebraska	1	------	1	------	(5)	------	------	------	------	------	x	x	------
New Hampshire	36	------	18	------	17	x	x	x	x	------	18	------	17
New Jersey	64	2	------	------	------	2	------	62	2	64	------	------	------
New Mexico	1	------	1	------	1	x	x	x	x	------	x	x	------
New York [3]	1, 170	135	(3)	------	162	(3)	------	------	------	190	------	------	581
North Dakota	1	------	1	------	------	x	x	x	x	------	------	------	------
Ohio	146	215	146	215	18	x	x	x	x	------	------	------	------
Pennsylvania	635	1	[4] 362	1	361	173	------	100	------	273	------	------	------
Rhode Island	8	24	5	20	------	x	x	x	x	------	3	4	1
Texas	1	1	1	1	1	x	x	x	x	------	x	x	------
Vermont [1]	5	------	5	------	5	x	x	x	x	------	x	x	------
Virginia	9	------	9	------	6	x	x	x	x	------	x	x	------
Wisconsin	108	1	1	------	0	53	1	28	------	79	26	------	23
TOTAL	2, 446	411											

[1] Reported up to Apr. 1, 1942.
[2] Of these totals, 551 applications granted and 88 denied for maximum hours and night work; 619 applications granted and 47 denied for 7-day week (in addition, 100 requests for 7-day week granted before Jan. 1, 1942).
[3] Reported up to May 1, 1942.
[4] Hours of work limited to 44; variations permit 48
[5] No report.

NOTES

NONREPORTING STATES:

No laws for 60 hours maximum:

Alabama
Florida.
Iowa.
West Virginia.
Tennessee (57½).
Georgia (60).
Kentucky (60).
Maryland (60).
Mississippi (60)

No authority to grant variations (as of June 1, 1942):

Arizona (48).
Louisiana (48).
Missouri (54).
North Carolina (48).

No reports received from:

Illinois.
Massachusetts.
Michigan.
Oregon.
South Carolina.
Washington.

No applications received by:

Oklahoma.
Nevada.
South Dakota.
Utah.
Wyoming.

Information: other States:

Idaho—no appropriation for enforcement.
Montana—overtime permitted if time and one-half paid.

REPORTING STATES:

Maximum weekly hours for women and minors in reporting States:

Arkansas	54	New Hampshire	48
California	48	New Jersey	54
Colorado	48	New Mexico	48
Connecticut	48	New York	48
Delaware	55	North Dakota	48
Kansas	49½	Pennsylvania	44
Ohio	45	Rhode Island	48
Indiana	(1)	Texas	54
Maine	54	Vermont	50
Minnesota	54	Virginia	48
Nebraska	54	Wisconsin	50

[1] No law for adults.

Stemming Industrial Hazards at the Start

America has a genius for production, for inventing new materials. With new industries, new industrial hazards often develop, and in the past thousands of workers have been diseased and died before we learned to control these hazards. Today, however, the Government is learning to eliminate such hazards before they cause extensive damage. The United States Department of Labor through its National Committee for the Conservation of Manpower in War Industries and its Division of Labor Standards offers an example of such progress in the work it is doing in the synthetic rubber industry.

This industry has had to find substitutes for toluol, now limited to the manufacture of munitions. Synthetic rubber is used in such important war accessories as barrage balloons and self-sealing gasoline tanks, built up of many layers of rubber cemented together. The hazard arises not from the synthetic compound, but from the toluol substitutes used as solvents to keep the cement liquid and to permit its drying rapidly.

Workers in synthetic rubber plants, noticing the toxic effects of toluol substitutes, have requested help from Washington. The fear among employees flamed into near panic in one Akron, Ohio, plant when white mice and canaries, placed in the workrooms as a check on contamination of the air, died under the eyes of the work force. The union immediately appealed to the War Production Board for action.

This request, relayed to the National Committee for the Conservation of Manpower in War Industries through the Division of Labor Standards, resulted in a conference called by the Director of the Division. Labor representatives, physicians, management representatives of the rubber companies, consultants in industrial hygiene, the Director of Labor Standards, and two members of his safety staff attended this conference. The visiting consultants included Philip Drinker of the Harvard School of Public Health, Warren Cook of the Zurich General Accident and Liability Insurance Company, Dr. Leonard Greenburg of the New York Department of Labor, and Allen D. Brandt and Dr. Paul A. Neal, representing the U. S. Public Health Service.

These people, representing all interested parties, were able to eliminate misunderstanding and misapprehensions—through frank discussion and complete development of the problem. Upon the basis of the conference, supplemented by further research, the National Committee plans to publish a series of small bulletins devoted to the nature and methods of control of the various health hazards involved in the fabrication of synthetic rubber.

Birth Certificate No Longer Required

Workers seeking employment in war plants where secret or confidential Government orders are being filled will no longer have to present birth certificates to prove American citizenship, Paul V. McNutt, War Manpower Chairman, has announced. The applicant need only sign a simple declaration that he is a citizen, in the presence of an Army or Navy District Procurement Factory or Plant Protection representative.

The Army and Navy, the War Manpower Commission, and the United States Employment Service developed this procedure jointly, because so many valuable man-hours of production were being lost through delays in obtaining certificates.

This new procedure does not relieve the employer from the duty of making further investigation when there is any reason to doubt the truth of the applicant's declaration that he is a citizen. Furthermore, workers signing the declaration will be informed that the penalty for misrepresentation may be as much as $10,000 fine or 5 years in prison, or both.

Legislation for Farm Workers

The La Follette Committee, after extensive hearings and investigations, is now publishing in 10 parts its report on industrial relations in California agriculture.

Nothing, says the Committee, will suffice short of "a democratic, balanced system of employer-employee relationships." The Committee is convinced that "it is the present responsibility of our Government, Federal, State, and local, to make democracy work in California's industrialized agriculture"—with increasing emphasis on Federal action. To that end the Committee recommends a comprehensive legislative program to secure the following objectives:

(1) Protection of the rights of agricultural labor in California to organize and bargain collectively;

(2) Decasualization, organization, and protection of the California agricultural labor market, including the establishment of a publicly controlled clearing house with adequate power to regulate the flow of employment in an orderly manner;

(3) Effective regulation of private recruiting of agricultural labor, interstate and intrastate;

(4) Application of child-labor laws to agriculture, except on home farms;

(5) Extending the social security program as regards both old age and unemployment to agricultural labor;

(6) Extension of minimum-wage and maximum-hours laws to cover agricultural labor;

(7) Establishment of a democratic procedure for determining fair wages;

(8) More adequate housing;

(9) Federal funds for extension of the health and medical program for agricultural workers;

(10) Placing industrialized agriculture on the same basis as nonagricultural employment under the State workmen's compensation law;

(11) Development of a national program of full employment;

(12) Program of rural resettlement on reclaimed public lands for the labor supply surplus that may follow any substantial decasualization of the California agricultural labor market.

Relation of State and Federal Labor Laws

Do Federal labor laws supersede State laws? This question has recently been brought up in several States.

The most recent case in point occurred in Illinois. There the question was, does the State 8-Hour Law apply to women employed by interstate railroads or is it superseded by the Fair Labor Standards Act? The Illinois attorney general, reversing his original opinion, has ruled that the State law does apply in such cases. He bases his reversal on an opinion letter written to him by Warner W. Gardner, Solicitor of Labor, United States Department of Labor.

Solicitor Gardner points out that the Fair Labor Standards Act, section 18, expressly preserves higher standards, set by State law or local ordinance, in regard to hours, minimum wages, and child labor. He then states that the Federal law imposes no limitation on hours, while the State law limits hours to 8 per day, thus setting a higher standard. "Hence, it is our opinion," he says, "that the Illinois statute continues in effect even for workers covered by the Fair Labor Standards Act." He adds that in all cases, of course, where the Fair Labor Standards Act applies, overtime as required by that law must be paid for hours in excess of 40 per week.

Supreme Court decisions, Solicitor Gardner emphasizes, support these conclusions. A review of these well-established legal principles may be useful to labor departments in other States where the same issues may be raised.

In the case of *Maurer* v. *Hamilton*[1] the Court stated that "As a matter of statutory construction, congressional intention to displace local laws in the exercise of the commerce power is not, in general, to be inferred unless clearly indicated by those considerations which are persuasive of the statutory purpose. This is especially the case when public safety and health are concerned."

In *Kelly* v. *Washington*[2] the Court expressed the same general principle in the following language:

"* * * The principle is thoroughly established that the exercise by the State of its police power, which would be valid if not superseded by Federal action, is superseded only where the repugnance or conflict is 'so direct and positive' that the two acts cannot 'be reconciled or consistently stand together.' " (Citing cases.)

Solicitor Gardner concludes his opinion letter with the explicit statement that "* * * In the light of these decisions, there is no reason for holding that the Illinois Eight Hour Law for Women is superseded by the Fair Labor Standards Act. The statutory purposes of both acts are in no way exclusive of each other, and there is no 'direct and positive' conflict between the provisions of the two Acts which would indicate that they 'cannot be reconciled or consistently stand together.' These principles are of particular force in the instant case, since a State statute is involved which is designed to 'protect the lives and health' of the people of the State. And whatever doubt there may be would seem dispelled by section 18 of the Fair Labor Standards Act, which expressly provides that the State law is not to be displaced."

In a similar case in California, the State attorney general held that the State's Day-of-Rest Law applies to railroad workers. After citing the Federal laws relating to railroad workers—the Fair Labor Standards Act, the Hours of Service Act of 1907, and the Railway Labor Act—the opinion states:

> If any of the provisions of these acts indicate that Congress has intended to exercise its authority to adopt a complete system of laws relating to the conditions of labor of employees of railroads, the law of this State would be inapplicable. However, none of the acts above referred to evidence any regard for the number of days per week or the number of consecutive days upon which an employee of a railroad may be employed, and I am of the opinion that the "Day-of-Rest Law" of this State is, therefore, applicable to persons employed by railroads.[3]

The weight of evidence in all these cases is at variance with the opinions of attorneys general in Washington and Louisiana. In Washington the question was, does the Fair Labor Standards Act set aside the State child-labor laws and the State minimum wage and maximum hours laws for women? In Louisiana, does the Fair Labor Standards Act render inoperative a State law regulating time and method of paying wages? In these two States the attorneys general held that congressional entry into a field amounts to suspending all State legislation in the interstate

[1] *309 U. S. 598, 614 (1940).*

[2] *302 U. S. 1,10 (1937).*

[3] Following this opinion, the legislature amended the State Day of Rest Law specifically to exclude railroad employees.

portion of that field. But since the Fair Labor Standards Act expressly preserves higher State standards on hours, wages, and child labor and does not contain statutory provisions on the time and method of wage payment, there seems to be no valid basis for the setting aside of such State laws.

New Officials Take Office

Several State labor administrators have taken office in recent months. J. M. Wise has succeeded John H. Dukes as Chairman of the South Carolina Industrial Commission.

J. T. Martin has been named Chief Inspector, Division of Workshop and Factory Inspection in the Tennessee Department of Labor. He replaces C. J. Lynch.

In Virginia, John Hopkins Hall, Jr., has been appointed Commissioner of Labor and Industry, replacing Thomas B. Morton, and O. C. Moore has been named Assistant Commissioner.

Wendell Grover has been appointed Chairman of the Utah Industrial Commission, replacing William M. Knerr, who died last January. Eldred M. Royle has also been appointed to the Commission.

A. V. Lundgren has become Commissioner of Labor in Kansas, a position formerly held by Jeff A. Robertson.

John Thomas Hayes has replaced Morgan R. Mooney as Deputy Labor Commissioner in Connecticut.

George L. Coffinberry has been named Public Representative on the Ohio Industrial Commission to complete the term of Clarence H. Knisley, who resigned July 1, 1942.

Exposure of War Workers to Radium

Radium painting on the delicate instruments needed for aircraft control generally is done by women. These require luminous dials and indicators to give visibility for night flying. No doubt there now are well over 1,000 workers on dial painting, and the number is fast increasing to meet the needs of the accelerating production. The work is concentrated in New York, New Jersey, Connecticut, Massachusetts, Pennsylvania, Maryland, and Illinois.

There is no longer so much danger from the pointing of brushes with the lips, which formerly caused such shocking cases of poisoning and slow death. In fact, the modern adhesives used are so unpleasant in taste as to deter this practice. Established plants have developed careful procedures for the use of radioactive paints.

In spite of the possibility of new establishments in the industry, and the rapid influx of new workers and new supervisors in the older plants, calling for special care at this time, there are no legal restrictions on the sale of these paints. Further, new and unsafe practices have been found recently: Home manufacture, with no supervision or protective measures; a dusting process much more hazardous than the painting; repair and repainting without protective respirators; and other practices involving unusual and highly dangerous exposure. Moreover, the fluorescent paint now substituted by the Navy to forestall the hazards of radium painting may have ills for the worker not yet recognized.

During World War I employment in painting dials with self-luminous paint increased; at peak about 350 workers, chiefly women, were so engaged. These were women who had experience in painting small figures and designs accurately with ordinary paints, usually nonpoisonous. It was light, pleasant, and well-paid employment, and during the early years of the industry there was no knowledge of its serious physical effects. Most of the need was for watches for men in the service. After the war, employment in the industry dropped; in 1939 only about 40 persons were so engaged, but by early 1941 these had increased to about 300. The number is expanding rapidly. Luminous dials now are used on airplane instrument boards, and on instruments for ships, submarines, and other scientific and technical devices.

The disastrous results of the use of self-luminous paint in the early days resulted in the accumulation of information as to the physical hazards involved in its use. Methods for control now are well known and widely used. They include specific precautions in the workroom, in storing and handling materials, particular measures for cleanliness, and physical examinations of workers.

Workroom conditions should be such as to protect the worker. Stocks of material should be kept in lead containers and lead-lined safes, since lead is a protection from certain of the dangerous rays from radium. Exhaust systems should be installed at work tables, which themselves are made of enameled metal with sheet lead underneath glass-enclosed tops.

The workers' health should be guarded by careful physical examinations at regular intervals. Only women who are naturally neat, clean, and careful should be employed at dial painting. The washing routine before lunch and before quitting time should be rigid, requiring every girl to scrub her hands with soap and hot water. From the washroom girls should pass into a darkroom containing mercury lamps which show up minute particles of luminous material. Hands are then to be cleaned of such specks with suitable solvent and the girls to return to the washroom for another scrub with soap and water. Care should be exercised to keep street and work clothing separate.

The radon concentration in the workroom, as well as the radium deposit in the workers' bodies, should be kept well within the permissible limits fixed by the National Bureau of Standards in its recently issued Handbook No. 27 entitled, "Safe Handling of Radioactive Luminous Compound." The New York State Division of Industrial Hygiene also has issued rules for the protection of dial painters. The United States Children's Bureau under the Fair Labor Standards Act has declared occupations involving exposure to radioactive substances hazardous to minors between 16 and 18, thus establishing the minimum age for such employment at 18 years.

Women in Responsible Jobs in the War Effort

Women are being employed in technical, management, scientific, engineering, and accounting jobs in places hitherto reserved exclusively for men, according to a survey of a large number of colleges in all parts of the country. Many colleges are offering special courses along these lines to women with some background of science or mathematics. Women engineers, chemists, architects, women in almost any scientific or professional field outside of teaching, nursing, or dietetics, have been rarities. Now there is great demand for women with such training or experience, or with the interest to undertake such training.

Women specialists already are forwarding the war effort. Outstanding in the chemical field is a woman who works on finishes that will resist salt water, sleet, changes in temperature, fluids like de-icers, and so on. There can be no corrosion on a bomber. The first woman to graduate from a special university course in the composition of high explosives is now working in an ordnance plant. Another investigates the chemistry of lubrication oils. There is a woman specialist in aluminum alloys, one doing research in radio communication, another teaching Navy courses in the same field. The first woman to get a mechanical engineer's degree is working on air conditioning.

Women with artistic talents may turn to camouflage. A New York concern in this field expects all increases and replacements in personnel to be women. The Public Building Administration has appointed a woman as consultant on defense housing projects. She concentrates on plans for interiors, stressing economy in building costs and short cuts for the homemaker through careful arrangement of closets and hallways. Both the Weather Bureau and the Civil Aeronautics Administration need women in the field of meteorology, and special courses are now open to them.

New places, too, are being found for women in services long the province of their sex. Mrs. Meryl P. Stone is a food consultant in the Subsistence Branch of the Quartermaster Corps, working with Miss Mary Barber, food consultant to the Secretary of War. Thousands of women must work to maintain the country's health, not only as trained nurses but as dietitians, technicians, medical-social workers, medical-record librarians, and dental hygienists. Jobs are available for thousands of women in occupational therapy, and a shortened and intensified course of training in this field is being offered at one of the universities. Of more than 800 registered therapists in the country, all but 25 are women. More doctors are needed for the armed forces. While women are eligible to join the Medical Reserve Corps of the Army, they are not given officer rating. They may not join the Medical Reserve Corps of the Navy. Nurses, on the contrary, are eligible for both services and receive military rating, though not a corresponding rate of pay. During the First World War contract surgeons, 34 of whom were women, were employed at Army base hospitals but received less pay than members of the reserve corps. British armed services welcome women doctors, giving them equal rank, salaries, and other privileges with men.

There is a demand for women engineers, architects, and mathematicians. A large electrical company has admitted such women to its staff, where they are doing well in men's jobs. Women who have majored in sciences and who hold amateur radio licenses are needed either in radio location work in research laboratories or in development and installation of radio communication facilities. Laboratory work is employing many women and will need more. For example, 56 women are doing tests on steel in an Ohio plant. Women are being trained to replace men in the testing of bituminous materials in a State highway department. Women with a background of science or mathematics are wanted to inspect gages to be used in testing ordnance materials.

Colleges and universities in various parts of the country are offering special courses along scientific lines. Some engineering departments are admitting women for the first time. Special training is being offered women for supervisory or personnel work, and for office positions formerly held by men.

Great Britain is recognizing the contribution to be made by women with special experience or education. The Women's Technical Service Register has been set up by the Appointment Department of the Ministry of Labor and National Service. The following are occupations that may be filled from the register:

Instructors in works training schools.
Junior draftswomen.

Assistants in planning, production, and progress departments.
Assistants in estimating and rate-fixing offices.
Motion or time-study workers.
Electrical technicians and testers.
Laboratory assistants for radio and other branches of research.
Assistants in mechanical testing and metallurgical departments.
Inspectors, examiners, or assistant examiners for higher-grade work.

It is not anticipated that many women will be found available who already have experience or training in the occupations listed, but women with a good education and mathematical or mechanical bias can be trained quickly to do valuable work in such posts. Some firms are willing to do their own training from start to finish. For those who require some elementary knowledge of engineering as a basis, the Ministry is prepared to give background courses.

Women are already filling responsible positions along these lines. In a plant repairing aircraft, women extract from a complicated set of blueprints all the parts and material required to complete the repair job; they record in what department details are to be made, the exact amount of material required, and select other sources of replacements. A woman in a shell factory has charge of all production figures. As assistant to a department manager, another woman reads the most complicated drawings, sets up machines, and adjusts tools. She must see at a glance whether these are cutting correctly.

It has been found that women are very good at instructing other women. One large electrical firm employs a woman as chief instructor in its training school. In an aero-engine works, though the instructors are men, a woman makes an ideal head of the training school. Her technical knowledge enables her to put each girl into the type of training for which she is best fitted and to see that she is suitably placed when trained.

War Emergency Acts Affecting Women

Only 10 States have found necessary any legal changes or new laws that affect women's employment in order to meet emergency needs for industrial production.[1] On the whole the work standards required by law are such as experience has proved will best aid maximum output as well as the worker's health. Of the few legal adjustments that have been made as to labor standards, a number are relatively minor.

In 17 States, basic statutes covering women's work in manufacturing contain elastic provisions applying to work hours, night work, or allied subjects.[2] Others have issued emergency orders, or have granted permits where war work is involved. For the most part new laws, orders, or amendments apply specifically to war emergency.

All the major industrial States employing large numbers of women in manufacturing have made ample provision for emergency. In all, 33 States have established exemption procedures and 4 others are prepared to handle exemptions. Six either have no labor laws applying to women or their hour laws permit such a long maximum that no exemption would be needed.[3] Five other States have established no procedure.[4]

The list following shows the States that since Dec. 7, 1941, have passed laws affecting labor standards for women. Further details of such action are shown in the WOMAN WORKER for May.

General emergency acts—Maine, Massachusetts, Rhode Island.
Weekly work hours—New York, Virginia.
Rest or lunch periods—Maine, New Jersey, New York.
Night work—New Jersey, New York.
Sunday or 7th-day work—New York, South Carolina.
Holidays—Kentucky.
Overtime pay—New York.

[1] *Changes in labor laws in Kentucky, Maine, New Jersey, New York, South Carolina; war emergency acts that apply specifically (New York and Virginia) or that can be applied (Maine, Massachusetts, and Rhode Island) to labor provisions; and two additional States that passed laws in 1941 but before Dec. 7—Connecticut, an hour law, Nebraska, a night-work law, both described in the May* WOMAN WORKER.

[2] *Includes night-work prohibition laws or orders in 4 States, 1-day's-rest-in-7 laws in 10 States, and 48-or-less-maximum hour laws in 10 States; 22 States fix a maximum over 48 hours a week in some manufacturing plants and 8 States fix no weekly-hour limit.*

[3] *Alabama, Florida, Georgia, Kentucky, Mississippi, West Virginia.*

[4] *Arizona, Louisiana, Maryland, Missouri, Tennessee.*

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July 1942

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Employment of Women in War Production

Labor-Force Reserves — p. 16.
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Wartime Federal Civilian Employees and Old-Age and Survivors Insurance

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Social Security in Review

A MANAGEMENT-LABOR POLICY COMMITTEE of the War Manpower Commission, to be composed of seven national labor leaders and seven leaders of war production and transportation management, was set up on June 9. In an order issued by Mr. McNutt, Chairman of the Commission, the committee is authorized "to consider and recommend to the Chairman matters of major policy concerning the activities and responsibilities of the Commission" and also to make studies on its own motion and to initiate the formulation of manpower policies in addition to considering policies referred to it by the Chairman.

At its first meeting on June 9 the committee requested the Chairman of the Commission to "impress upon the Bureau of the Budget and the Congress their responsibility to provide means for the harvesting of food and other agricultural production for our armed forces, our allies, and our civilian population." If such appropriations were not promptly provided, the resolution added, the President should be requested to allocate the necessary money from his emergency funds.

The eight-point program, announced May 21 by the Chairman and reported in the June Social Security in Review, was implemented by the Manpower Commission on June 25 with the issuance of the eight "directives"; the four addressed to the U. S. Employment Service are summarized briefly in this issue in the Employment Security section. The directives establishing priority in recruitment of workers for war industries and dealing with the recruitment of transient agricultural workers both contain safeguards with respect to wages and working conditions. The Director of the USES is permitted to withhold referrals to jobs in companies where:

"(A): The wages and conditions of work are not at least as advantageous to a worker referred to a job opening therein as those prevailing for similar work in similar establishments in the industrial area; or

"(B): Proper measures have not been or will not be instituted to reduce or eliminate its use of or need for workers in critical war occupations by effective utilization, through training, upgrading, appropriate personnel transfers and job simplification, of the workers employed in such establishments; or

"(C): Its need for additional workers in critical war occupations can be reduced or eliminated by the transfer of workers, employed in nonessential activities in such establishment or in another employing establishment under the same ownership or control in the industrial area."

Similarly the Employment Service is directed not to recruit agricultural workers for "any agricultural employment in which the wages or conditions of work are less advantageous to the worker than those prevailing for similar work in the locality."

Establishment of a Negro Manpower Service within the Manpower Commission was announced by the Chairman on June 20. The Service, created to assure full utilization of Negroes in war-industry jobs and to afford training facilities for such jobs, will be under the general direction of Arthur J. Altmeyer, Executive Director of the Commission.

The appointment of John J. Corson as Chief of the Industrial and Agricultural Employment Division of the Manpower Commission was announced by Mr. McNutt on June 17. Mr. Corson continues as Director of the USES and Director of the Bureau of Employment Security of the Social Security Board.

BIRTH CERTIFICATES to prove American citizenship for persons who want jobs in plants working on secret or confidential Government contracts will no longer be required, according to an announcement of the War Manpower Commission Chairman on July 6. State and local registration systems have been subject to an unprecedented

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strain from the demands for duplicate birth certificates and delayed birth registrations, and many valuable man-hours of production have been lost through delay in obtaining the certificates. The new procedure, developed jointly by the Army and Navy, the Manpower Commission, and the USES, calls for only a simple declaration that the applicant is a citizen. This declaration, however, must be signed by the worker in the presence of an Army or Navy District Procurement, Factory or a Plant Protection representative.

THE USUAL UPWARD MOVEMENT in unemployment benefit payments in May, after the initiation in many States of new benefit years in April, was reversed this May. The $31.7 million disbursed in unemployment benefits was 13 percent less than April disbursements. The 2.5 million man-weeks of unemployment compensated in May also represented a decline of 12 percent from the April number. Although total payments were slightly above May 1941 disbursements, the fact that the total number of man-weeks compensated declined about one-eighth indicated that the higher level of benefit payments was due to liberalized benefit formulas and higher base-period earnings rather than a greater volume of unemployment. Approximately 858,000 different individuals received at least one benefit payment during the month, some 12 percent fewer recipients than in April.

More than 782,000 jobs were filled by the USES in May, 600,000 of them nonagricultural and 182,000 farm placements. The rise from April in total placements was 29 percent, in nonagricultural placements, only 8 percent; the major part of the gain was in the agricultural placements, which were 3½ times the April level. States registering the sharpest increases in farm placements were Arkansas, Kentucky, Mississippi, and Tennessee. In comparison with placements in May 1941, almost one-fourth more nonagricultural jobs were filled this May, and agricultural placements increased more than a third.

The number of job seekers registered at public employment offices decreased in May for the fourth successive month. The active file of 4.3 million registrants was the smallest in number for any month, except October and November 1941, since the Employment Service was established. The number of women registrants rose slightly, as in April, to 1.4 million at the end of the month, but registration of men dropped 6 percent to 2.8 million. In comparison with last May, there was no significant lessening in the number of women registered for jobs; registrations of men, on the other hand, dropped almost one-fourth. The ratio of women to all the registrants rose from 29 percent in May 1941 to 33 percent in May 1942. Discussion of various aspects of the employment of women and of the potential expansion of the female labor force will be found in special articles in this issue of the Bulletin.

OLD-AGE AND SURVIVORS INSURANCE data offer other evidence of the shifting composition of the current labor force. Analysis of employee accounts established in the first quarter of 1942 shows that the proportion of women among all applicants for account numbers was 48 percent, the highest percentage for the first quarter of any year and 14 percent above the first quarter of 1941. Accounts established for women aged 25–44—the group made up mostly of housewives and women in noncovered jobs—were 24 percent more than in the comparable quarter of 1941. The influx of young persons into the labor market is shown by a 32-percent increase in the number of accounts established for boys and girls under 18 years. This large increase reflects the relaxation of legal working-age requirements in response to the growing demand for the services of young persons as unskilled workers.

In May, for the first time since the beginning of the old-age and survivors insurance program, more than 10 percent of all benefits in force were in conditional-payment status—an indication of the increasing number of beneficiaries who are returning to covered employment. The total number of benefits in force at the end of May was 579,000, an increase from 562,000 in April and 354,000 in May 1941. The total amount of benefits in force was $10.5 million; on April 30 the total had been $10.2 million, and at the end of May 1941 it was $6.5 million.

AFTER REACHING in April the lowest level since April 1934, public assistance and earnings under Federal work programs declined 5.8 percent to $141.6 million in May. This was the lowest amount spent for these programs in any May since 1933. The estimate of 8.9 million persons in 3.7 million households was considerably lower than in

May a year ago. Over the 12-month period the number of persons employed on Federal work programs had decreased 52 percent, and earnings had decreased 47 percent.

Although payments for the three special types of public assistance were higher than in May 1941, earnings and payments under all other programs declined sharply. General relief payments were 10 percent lower than in April 1942 and 34 percent below payments in May 1941. WPA earnings dropped 10 percent from April and were 43 percent less than in May 1941.

THE SERVICEMEN'S DEPENDENTS ALLOWANCE ACT of 1942, signed June 23, provides family allowances for dependents of enlisted men of the fourth, fifth, sixth, or seventh grades of the Army, Navy, Marine Corps, and Coast Guard. The act, to be administered by the Secretaries of War and of the Navy, stipulates that the monthly allowance payable shall consist of the Government's contribution and a fixed amount from the pay of the enlisted man.

Two classes of dependents are defined: Class A comprises the wife, child, or the divorced wife; Class B dependents are parents, grandchildren, brothers, or sisters, who are found to be dependent on the enlisted man for a substantial portion of their support. The Government's contribution for Class A dependents will be $28 a month if there is a wife but no child and $40 for a wife and one child, with an additional $10 for each additional child. When the enlisted man has no wife but one child, the sum payable by the Government is $20 with an additional $10 for each additional child. If the enlisted man has a divorced wife, $20 is payable in addition to the amounts granted other Class A dependents. For Class B dependents, the Government's share is $15 for one parent, $25 for two parents, and an additional $5 for each dependent grandchild, brother, or sister, but not more than a monthly total of $50; if there is no dependent parent, $5 will be allowed each grandchild, brother, or sister up to a monthly total of $50.

For any month for which a family allowance is paid, $22 is to be taken from or charged against the enlisted man's pay; an additional $5 is withheld if the allowance goes to both Class A and Class B dependents. The enlisted man's allotment to Class B dependents is voluntary and may be terminated at his written request. Allowances may not be paid "for any period prior to June 1, 1942, or for any period when the United States is not engaged in a war declared by Congress and which is more than 6 months later than the date of termination of any such war," and no allowance which accrues before November 1, 1942, shall actually be paid until after that date.

The enactment of this legislation was preceded by the passage of the Pay Readjustment Act of 1942, signed by the President on June 16, which put into effect the first general pay increase in 20 years for personnel of the Army, Navy, Marine Corps, Coast Guard, Coast and Geodetic Survey, and Public Health Service. For the men in the grades to which the Servicemen's Dependents Allowance Act applies, the base pay was raised to $50 for the men of the seventh grade, $54 for men of the sixth grade, $66 for men of the fifth grade, and $78 for the fourth grade.

APPROPRIATIONS for the work of the Social Security Board during the fiscal year 1942–43 were provided in the Labor-Federal Security Appropriations Act, 1943, signed by the President on July 2. The act provides $26.6 million for salaries and expenses of the Board; $329 million for grants to States for old-age assistance; $78 million for aid to dependent children; $8.7 million for aid to the blind; $79.7 million for unemployment compensation administration, including operation of employment office facilities and services essential to expediting the national defense program; and $2.5 million for the selection and testing for, and placement of, workers in occupations essential to the national defense.

The same act abolished the Civilian Conservation Corps, specifying that the "liquidation shall be completed as quickly as possible but in any event not later than June 30, 1943." The Director of the CCC was authorized to dispose of camp buildings and equipment by transfer, with or without reimbursement, to other Federal agencies or, with the approval of the Federal Security Administrator, to any State, county, municipality, or nonprofit organization for the promotion of conservation, education, recreation, or health. Before any buildings and equipment are disposed of, however, they must first be offered to the War and Navy Departments for war use or to the Civil Aeronautics Administration.

Employment of Women in War Production*

DURING THE WAR PERIOD OF 1914–18, more women entered the labor force than ever before. They worked not only as clerks and saleswomen but also as lathe operators, punch-press operators, single and multiple-spindle-drill-press operators, grinders, riveting-machine operators, inspectors, crane operators, assemblers, and case makers. In some war industries, such as aircraft, the employment of women rose from negligible proportions before the war to about 19 percent in 1918. In other war industries the proportions were considerably higher: 37 percent in optical goods, 35 percent in rubber goods and in photographic supplies, 33 percent in leather goods, and 27 percent in electrical goods.[1] At the close of the First World War, women constituted some 20 percent of the working force in all manufacturing industries in the United States.

Women going to work in factories for the first time were trained in courses conducted in and outside the plants. Many women were trained in the factories in vestibule training schools. In strenuous jobs in which direct replacement of male workers was not practicable, job break-down made the employment of women possible. Whenever careful consideration and thought were given to the problem of training, the employment of women in factories was highly successful.

The serious shortage of agricultural workers which had developed by the spring of 1918 also made demands on women as farm workers. A recruiting program was carried on by the Farm Bureau and other organizations. County exchanges were established to mobilize labor for agriculture, and women over age 18 were registered. In some 20 States women organized themselves into a Women's Land Army, which furnished 15,000 additional workers trained by the organization. Many other women got agricultural jobs through their own efforts.

In Great Britain the number of women employed in industry rose from 3.3 million in July 1914 to 4.9 million in July 1918.[2] In addition, about 500,000 women left domestic service for other employment during the same period. In some jobs women replaced men directly; elsewhere, jobs were broken down into component parts, which women then could perform. To meet the growing demand for agricultural labor, voluntary organizations such as the Women's Land Service Corps (Government aided) recruited and placed women on farms. Between 1914 and 1917, 44,500 additional women supplemented the agricultural labor force. Careful selection was made of the women placed, and preference was given those with agricultural training. Care was taken to ensure the safety and comfort of women farm workers, and the women proved of considerable aid in meeting the labor requirements of an expanded agricultural program.

In the post-war period in this country, the employment of women decreased when men returned from the armed forces. The revival of business activity during the twenties, however, again encouraged the employment of women. By 1929 they constituted 22 percent of all employees in manufacturing industries. Among the industries in which women continued to be employed in large numbers were leather, chemicals, electrical-machinery, and scientific-instruments. Similar trends prevailed in other countries. While the peak of female employment never reached the wartime level in either Germany or Great Britain, the proportion of women in the labor force definitely increased during the twenties.

At the outbreak of hostilities in Europe in 1939, the rearmament program had already been in effect in Great Britain since 1936 and in Germany since 1933. After a brief rise in employment at the beginning of the rearmament program in each of these countries, the conversion of industries to war production and the curtailment of consumer-goods production led to serious unemployment, particularly among women. This situation was repeated in the United States; as employment increased during the latter half of 1940, the active files of public employment offices showed a marked decrease. In 1941, however, with displacements in consumer-goods industries affected by priorities and shortages of essential materials, registrations of women rose. In all three countries, after the

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*Prepared in the Reports and Analysis Division, Bureau of Employment Security. The material was assembled by Mildred A. Joiner and Clarence M. Weiner.

[1] U. S. Department of Labor, Women's Bureau, *The New Position of Women in American Industry*, Bulletin No. 12, 1920, pp. 35, 86.

[2] Wolfe, Humbert, *Labour Supply and Regulation*, London, 1923, p. 77.

initial temporary displacements, unemployment declined fairly rapidly.

Not until the supply of skilled and semiskilled male workers in Great Britain was practically exhausted did the Government resort to compulsory registration and conscription of women. In March 1941 more than 1.2 million women between the ages of 20 and 24 were registered for war work. Unemployed women and those not normally in the labor force were made available to war industries and the Auxiliary Territorial Service. Early in 1942 the British began the compulsory registration of women up to age 38. Women in the other age classes are to be registered and interviewed as need arises. In addition, the British Government made job-dilution agreements with many trade-unions and trade associations whereby women could be employed on work formerly done by skilled male workers. With the job-dilution agreements, compulsory registration of women, and the continued rise in production, the number of unemployed women decreased from 440,000 in January 1940 to 153,000 by June 1941.

Germany has also met its labor shortage by the recruitment of women in increasing numbers. Contrary to popular belief, the Nazi philosophy of "Kinder, Küche, und Kirche" never decreased the number of women in the labor force. A compulsory work program was introduced for unmarried women under 25 which required a year's work in either agriculture or domestic service. Arrangements for the training and retraining of girls and women were extended. Not only did the women adapt themselves to their new work but because of their manual dexterity their output was in some cases greater than that of the men. Since 1940 there has been a very marked increase in the employment of women, especially married women, and special efforts have been made to organize part-time shifts and communal nurseries for the care of the children of working mothers. The widespread installation of new machinery and technical equipment further extended the use of women by eliminating heavy manual work and weight lifting.

In the United States there has been as yet no Nation-wide compulsory registration of women for employment. There is still a reserve of unemployed men available in most areas, and in those where there has been a special need women have registered voluntarily in sufficient numbers to meet the needs.

Size and Characteristics of the Female Labor Force

The census of population of 1890 listed 4 million women as gainful workers, or 17 percent of the total of 23.3 million persons in gainful occupations. Each decade thereafter, the number and proportion rose; by 1930 there were 10.8 million women out of a total of 48.8 million gainful workers or 22 percent. According to 1940 census figures, there were 52.8 million persons in the labor force during the last week of March 1940, of which 12.8 million or 24 percent were women. The Census of Manufactures found that women comprised 20 percent of all employees in manufacturing industries in 1919, 22 percent in 1929, and 25 percent in 1939.

The increase in the number and proportion of gainfully occupied women has been notable in a number of States.[3] From 1930 to 1940, women workers increased 20 percent in Pennsylvania, 16 percent in North Carolina, 14 percent in Maryland. The District of Columbia in 1940 (as in 1930) led the Nation with 45 percent of its women 14 years of age and over in the labor force. Other States with large proportions of women in the labor force are Massachusetts, Rhode Island, Connecticut, New York, New Jersey, South Carolina, Georgia, and Florida.

Of the 11.1 million women employed during the last week of March 1940, more than one-fourth —2.9 million—were employed in personal-service industries, mainly domestic service (table 1). The second largest group, 2.3 million, was employed in manufacturing industries, principally in apparel factories and textile mills. More than 2 million women were employed in wholesale and retail trade, and 1.8 million were in professional and related service industries, mainly as teachers and trained nurses.

Women outnumbered men in a number of important industries. In personal service nearly three-fourths of the employed workers were women; in domestic service, nine-tenths. Two-thirds of the employed workers in factories manufacturing apparel and other fabricated mill products were women; more than half in the com-

[3] For information on percentages in urban areas, see "Estimating the Potential Expansion of the Female Labor Force in Urban Areas," in the Employment Security section of this issue.

munication industry—mainly in telephone and telegraph companies—and in hotels and lodging places were women. Other industries in which women constituted a significant proportion of all workers of the industry were textile mills; leather and leather products manufacturing; eating and drinking places; and laundering, cleaning, and dyeing establishments.

According to the census data, working women as a group are younger than men. In the last week of March 1940, half the women were under 31 years of age, whereas the median age of men in the labor force was 37. More than one-third of the women in the labor force were 20–29 years of age, whereas men in these ages constituted only one-fourth of all men in the labor force. It is significant that 68 percent of the women in the labor force were in the child-bearing ages 20–44

Table 1.—*Employed workers 14 years old and over, by industry group and sex, United States, March 24–30, 1940*

Industry group	Total	Men	Women		
			Number	Percent	Percentage distribution by industry group
Total population (all ages)	131, 669, 275	66, 061, 592	65, 607, 683		
All persons 14 years old and over	101, 102, 924	50, 553, 748	50, 549, 176		
In labor force	52, 789, 499	39, 944, 240	12, 845, 259	24. 3	
Employed workers (except on public emergency work)	45, 166, 083	34, 027, 905	11, 138, 178	24. 7	
Unemployed and on public emergency work	7, 623, 416	5, 916, 335	1, 707, 081	22. 4	
Total employed workers (except on public emergency work)	45, 166, 083	34, 027, 905	11, 138, 178	24. 7	100. 0
Agriculture, forestry, and fishery	8, 475, 432	7, 988, 343	487, 089	5. 7	4. 4
Mining	913, 000	902, 061	10, 939	1. 2	. 1
Construction	2, 056, 274	2, 022, 032	34, 242	1. 7	. 3
Manufacturing	10, 572, 842	8, 250, 590	2, 322, 252	22. 0	20. 8
Food and kindred products	1, 093, 628	894, 534	199, 094	18. 2	1. 8
Textile-mill products	1, 170, 024	692, 353	477, 671	40. 8	4. 3
Apparel and other fabricated textile products	780, 664	265, 324	515, 340	66. 0	4. 6
Logging	141, 495	140, 233	1, 262	. 9	(1)
Sawmills and planing mills	435, 559	427, 072	8, 487	1. 9	. 1
Furniture, store fixtures, and miscellaneous wooden goods	361, 523	319, 056	42, 467	11. 7	. 4
Paper and allied products	328, 241	256, 519	71, 722	21. 9	. 6
Printing, publishing, and allied industries	630, 677	501, 583	129, 094	20. 5	1. 2
Chemicals and allied products	439, 845	362, 241	77, 604	17. 6	. 7
Petroleum and coal products	201, 180	186, 821	14, 359	7. 1	. 1
Leather and leather products	364, 443	225, 529	138, 914	38. 1	1. 2
Stone, clay, and glass products	336, 745	293, 521	43, 224	12. 8	. 4
Iron and steel and their products	1, 263, 215	1, 169, 623	93, 592	7. 4	. 8
Nonferrous metals and their products	279, 454	239, 370	40, 084	14. 3	. 4
Machinery	1, 072, 250	909, 039	163, 211	15. 2	1. 5
Automobiles and automobile equipment	574, 931	525, 010	49, 921	8. 7	. 4
Transportation equipment, except automobile	305, 872	295, 866	10, 006	3. 3	. 1
Other and not specified manufacturing industries	793, 096	546, 896	246, 200	31. 0	2. 2
Transportation, communication, and other public utilities	3, 113, 353	2, 768, 267	345, 086	11. 1	3. 1
Railroads (including railroad repair shops) and railway express service	1, 135, 019	1, 099, 361	35, 658	3. 1	. 3
Trucking service	427, 623	414, 250	13, 373	3. 1	. 1
Other transportation	615, 029	586, 404	28, 625	4. 7	. 3
Communication	393, 300	182, 763	210, 537	53. 5	1. 9
Utilities	542, 382	485, 489	56, 893	10. 5	. 5
Wholesale and retail trade	7, 538, 768	5, 509, 228	2, 029, 540	26. 9	18. 2
Wholesale trade	1, 206, 761	1, 024, 914	181, 847	15. 1	1. 6
Food and dairy products stores, and milk retailing	1, 489, 303	1, 206, 548	282, 755	19. 0	2. 5
Eating and drinking places	1, 116, 202	637, 562	478, 640	42. 9	4. 3
Motor vehicles and accessories retailing, and filling stations	739, 311	695, 499	43, 812	5. 9	. 4
Other retail trade	2, 987, 191	1, 944, 705	1, 042, 486	34. 9	9. 4
Finance, insurance, and real estate	1, 467, 597	1, 013, 297	454, 300	31. 0	4. 1
Business and repair services	864, 254	787, 377	76, 877	8. 9	. 7
Automobile storage, rental, and repair services	479, 592	466, 305	13, 287	2. 8	. 1
Business and repair services, except automobile	384, 662	321, 072	63, 590	16. 5	. 6
Personal services	4, 009, 317	1, 133, 555	2, 875, 762	71. 7	25. 8
Domestic service	2, 326, 879	266, 943	2, 059, 936	88. 5	18. 5
Hotels and lodging places	552, 655	266, 755	285, 900	51. 7	2. 6
Laundering, cleaning, and dyeing services	442, 803	225, 933	216, 870	49. 0	1. 9
Miscellaneous personal services	686, 980	373, 924	313, 056	45. 6	2. 8
Amusement, recreation, and related services	395, 342	316, 063	79, 279	20. 1	. 7
Professional and related services	3, 317, 581	1, 472, 453	1, 845, 128	55. 6	16. 6
Government	1, 753, 487	1, 414, 069	339, 418	19. 4	3. 0
Industry not reported	688, 836	450, 570	238, 266	34. 6	2. 1

[1] Less than 0.05 percent.

Source: U. S. Bureau of the Census, Sixteenth Census of United States, 1940, Series P–10, No. 11.

years, although probably only a minor proportion of them had children under 16.[4] Women 45 years old and over were only 21 percent of the female labor force.

The extent to which men and women enter the labor force at different ages is illustrated in chart 1. At every age level more men than women are in the labor market, either at work or seeking work. At age 20 the highest proportion of women are in the labor force—48 percent of all women of that age. After they reach 20 or 21 years of age, women begin leaving the labor force in large numbers, because of marriage and the assumption of home responsibilities. On the other hand, men who have completed their schooling continue to augment the labor force; 95 percent of all men between the ages of 25 and 40 are in the labor force.

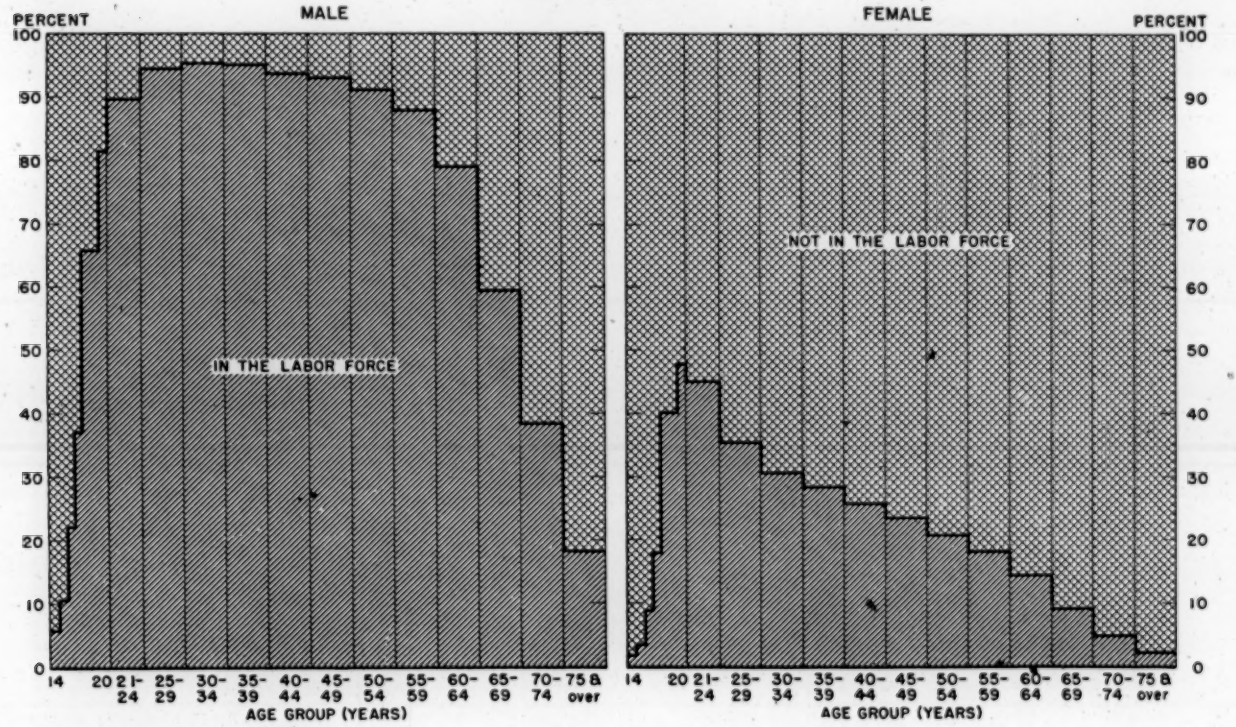
Factors To Be Considered in Utilizing the Female Labor Reserve

The problem of drawing millions of women into the labor force is more than a question of wage rates. Undoubtedly, appeals to patriotism would cause many women to seek war employment. Nevertheless some means will have to be found to relieve women homemakers of part of their family obligations before they can assume work outside the home. This problem has been met in some foreign countries through the establishment of community nurseries, staggered and part-time hours, and other measures which enable women to meet home obligations and still seek employment.

In addition to community nurseries in some industrial areas, various war firms in Great Britain have established crèches in the plants for the care of children of pre-school age. Where facilities for such care are not available in the factory, arrangements are frequently made for neighbors to care for children of working mothers. Part-time shifts have been arranged in many plants, to give women sufficient time to attend to their family duties. Persons too old to take on full-time employment are being taken back for part-time work in retail shops to relieve the shortage of workers and to release younger

[4] Census data for 1940 on age, race, marital status, employment status, and number of children of women, by age of the children, are not yet available.

Chart 1.—*Proportion of male and female population 14 years and over in the labor force, by age group, March 24–30, 1940*



Source: U. S. Bureau of the Census.

workers, both men and women, for war work.

In the United States, steps are being taken to establish day-care programs for children of mothers working in war industries. Numerous local, State, and national agencies, both public and private, are promoting activities in this field, but, if it is to be adequate, the program needs considerable expansion. No instances have been reported of part-time shifts organized for women war workers in this country, nor is it expected that such shifts will be necessary until the large reserve of full-time workers is exhausted.

The establishment of sanitary and healthful working conditions in establishments seeking additional female labor is another means of encouraging the entrance of women to the labor market. In both England and Germany it has been found that good working conditions, plus special provisions such as rest periods, adequate sick leave, and vacations, result in greater efficiency and less absence from work, for both men and women but especially for women.

Another factor operating to affect the utilization of the large female labor reserve is legislation in the various States governing the employment of women. Eighteen States prohibit the employment of women beyond 8 hours a day except in unusual circumstances, while 20 States set the maximum at 9 hours. About half the States set a maximum of 48 hours of work per week. Night work, usually defined as work between 10 p. m. and 6 a. m., is either limited or prohibited for women in 17 States.[5] In several States, restrictions apply to the employment of women under age 21; in others the restrictions are fixed at age levels ranging down to 16. Other legal provisions concerning women's employment require proper toilet and rest-room facilities, suitable arrangements for sitting at one's work, and adequate ventilation. Many States prohibit the employment of women in jobs which entail lifting heavy objects or in other activities deemed injurious to health.

The increased pressure of labor shortages has created a demand in some areas for the repeal of the laws governing the employment of women. By May 1942, Connecticut, New York, Massachusetts, New Jersey, and Wisconsin had amended their laws regulating night work for women in selected war industries. At the request of the War Department, the Secretary of Labor, on April 23, 1942, granted an exemption lowering the age minimum from 18 to 16 years for girls employed in about 15 manufacturing industries which furnish products to the Government under the Walsh-Healey Public Contracts Act. Girls under 18, however, may not be employed more than 8 hours a day and not between 10 p. m. and 6 a. m. Among the industries to which the exemption applies are food-processing, arms and ammunition, electrical-manufacturing, plastic-products, safety-appliances, machinery and allied products, converted-paper products, fabrication of metal products, chemicals, and drug and allied products.

The experience of Great Britain in repealing the provisions regulating the employment of women, particularly those relating to hours of work, is significant. Immediately after Dunkerque, the British factory laws regulating hours were suspended and night work for women was permitted. Men and women worked feverishly, and overtime was widespread. The results, however, were disappointing, for it was found that, despite the best efforts of the workers, long hours and night work increased the absenteeism and accident rates due to illness and fatigue among both men and women. The British factory laws have since been reestablished.

Prohibitions against the employment of women in jobs requiring heavy lifting were also found necessary in England and in Germany as well. This problem was solved in Germany by requiring employers to install new machinery to do the heavy work, thereby permitting the employment of women. In other instances in which new machinery could not be obtained it was found possible to break down the jobs so that men did the heavy lifting and women the rest of the work.

In general, it was found in both England and Germany that, in order to employ women satisfactorily in war production, the laws regulating employment conditions must be strengthened rather than weakened. Improved conditions resulted in increased efficiency and morale, not only of women but of male workers as well.

Occupational Potentialities of Women Workers

To determine occupations suitable for women,

[5] Since March 31, 1942, all but one of the States prohibiting the employment of women at night work have made special provision to permit night employment in war industries.

the Occupational Analysis Section of the U. S. Employment Service made a detailed analysis of 1,859 different occupations in 21 war industries and 937 occupations in nonwar industries. Almost 80 percent of the total number of war-industry occupations studied were jobs in which the degree of physical strength required and the conditions under which the work is performed presented practically no barriers to the employment of women. Women were already employed in some of the occupations but could be much more extensively utilized than at present. Even in the case of the remaining 20 percent of the jobs, for which considerable training is required, increased job dilution would make possible the employment of women after a reasonable period of training. For example, it usually takes 3 years to train precision-lens grinders. Certain phases of precision-lens grinding, however, such as blocking, centering, and inspecting, can be taught within a relatively short time, and women have been found to be most adaptable to these tasks.

Some of the occupations in which women could be employed with success are in the manufacture and assembly of parts for radio, motors, recording instruments, and airplane gauges. A large majority of the work in the manufacture of trucks, tanks, and final body assembly could be performed by women, particularly since heavy parts are now moved by machinery. In the shipbuilding and boatbuilding industries, women are acceptable for employment as boilermaker helpers, draftsmen, machinist helpers, blueprint machine operators, and flash welders. In foundries, women may be employed as casting cleaners, finishers, machine core makers, facing mixers, and in many other jobs. In the manufacture and servicing of aircraft, women can perform such work as metal fabrication, bench assembly, painting, covering, heat treating, anodizing, fuselage assembly, and welding.

Recent surveys by the Bureau of Employment Security of a number of important California firms employing significant numbers of women indicate that, in all the plants visited, the employment of women has been satisfactory. In all instances there was an increase in production per hour of work and a lowering of cost per unit, particularly when men and women were employed at the same wage, in the same department, and at the same jobs. In addition to the advantages of increased production and lower per unit cost, it was found that:

Women required less supervision and were decidedly easier to supervise;

Labor turn-over was noticeably decreased;

Once women were employed in the plant, the men employees made little objection to the employment of additional women workers;

With the same training and experience as men, even on difficult machine operations, women could be moved within a department or transferred to other jobs as readily as men;

In all instances the number of accidents had decreased appreciably;

The damage to tools and materials was considerably less than when similar work was performed by men. This was particularly true in instances in which women had been employed as operators of small drill presses and were using small drill parts.

Placements of Women, 1940–41

The number of women placed by public employment offices increased from 313,000 in the first quarter of 1940 to 510,000 in the last quarter of 1941, a rise of 63 percent (table 2). During the same interval, which approximates the period from the beginning of the defense program up to the declaration of war, male placements rose from 355,000 to 866,000, or 144 percent. The rapidly accelerated rate of hiring of men during this period accounts for the fact that the ratio of female to total placements declined from 47 to 37 percent.

Placement records by major occupational groups do not show any appreciable trend toward the greater utilization of women for war production (table 3). The larger proportion of clerical-and-sales placements going to women in recent months indicates, however, that women are releasing men in this field for more direct war production or service with the armed forces.

A tendency toward greater utilization of women in some isolated instances is shown by placements in 1941 for selected defense industries. In the aircraft industry, for example, public employment offices placed 460 women in the first quarter of 1941, or 2.6 percent of all aircraft placements; by the last quarter of 1941 the number of placements of women had risen to 3,200, or 7.7 percent of all

Table 2.—*Placements made by public employment offices in industry divisions, by quarter and by sex, January 1940–December 1941*

Industry division	January–March			April–June			July–September			October–December		
	Total	Women		Total	Women		Total	Women		Total	Women	
		Number	Percent		Number	Percent		Number	Percent		Number	Percent
1940												
Total	667,576	312,695	46.8	974,008	380,431	39.1	991,410	385,805	38.9	1,149,990	429,116	37.3
Agriculture, forestry, and fishery	26,651	2,200	8.3	111,974	17,225	15.4	114,316	10,402	9.1	76,501	7,595	9.9
Mining	4,281	111	2.6	5,593	132	2.4	6,575	159	2.4	6,191	118	1.9
Construction	71,918	375	.5	140,842	511	.4	155,709	726	.5	241,368	1,267	.5
Manufacturing	127,232	49,011	38.5	144,464	53,824	37.3	200,306	82,563	41.2	217,142	74,644	34.4
Transportation, communication, and other public utilities	22,601	1,237	5.5	21,578	1,254	5.8	22,915	1,214	5.3	27,878	1,478	5.3
Wholesale and retail trade	121,279	60,040	49.5	153,294	75,142	49.0	149,922	73,381	48.9	209,420	109,675	52.4
Finance, insurance, and real estate	7,123	2,761	38.8	8,980	3,212	35.8	7,552	3,123	41.4	8,250	3,127	37.9
Service industries	285,371	196,893	69.0	385,214	229,057	59.5	332,705	214,123	64.4	361,302	231,081	64.0
Establishments not elsewhere classified	1,120	67	6.0	2,069	74	3.6	1,410	114	8.1	1,938	131	6.8
1941												
Total	1,083,806	413,796	38.2	1,414,093	518,884	36.7	1,554,333	525,202	33.8	1,376,614	510,349	37.1
Agriculture, forestry, and fishery	33,635	3,287	9.8	92,209	13,301	14.4	129,645	10,863	8.4	68,196	4,908	7.2
Mining	5,681	153	2.7	6,974	193	2.8	8,838	209	2.4	7,340	209	2.8
Construction	250,127	1,428	.6	231,131	1,350	.6	311,007	2,158	.7	228,915	1,489	.7
Manufacturing	227,051	80,344	35.4	300,960	93,025	30.9	347,572	109,487	31.5	312,414	87,170	27.9
Transportation, communication, and other public utilities	29,387	1,611	5.5	39,722	2,462	6.2	42,815	3,302	7.7	39,347	2,307	5.9
Wholesale and retail trade	164,223	74,195	45.2	234,393	104,877	44.7	230,742	96,374	41.8	248,825	117,915	47.4
Finance, insurance, and real estate	9,323	4,202	45.1	12,605	5,046	40.0	12,659	5,189	41.0	11,032	4,442	40.3
Service industries	362,942	248,400	68.4	492,973	298,467	60.5	468,157	297,419	63.5	457,948	291,808	63.7
Establishments not elsewhere classified	1,437	176	12.2	3,126	163	5.2	2,898	201	6.9	2,597	101	3.9

aircraft placements for that quarter. Nevertheless, the number of women placed in this industry to date has been very small compared to the number that could be placed. Similarly, the proportion of placements in the industrial-chemicals industry rose, from 7.6 percent in the first quarter of 1941 to 18 percent in the last quarter. Other defense industries, however, continued to hire men as long as the supply was adequate.

The marked reluctance of employers during this first phase of the war program to hire women when qualified male applicants were available is also illustrated by the data for applicants registered with the public employment offices (table 4). In January 1941 the active file numbered 6.1 million registrants, of whom one-fourth were women; by March 1942 it had declined 25 percent to 4.6 million. The number of male applicants, however, declined 1.3 million or 29 percent during the same period, whereas the number of women applicants declined only 179,000 or 12 percent. Since June 1941, women have

Table 3.—*Placements made by public employment offices, classified by major occupational group, by quarter and by sex, July 1940–December 1941*

Major occupational group	July–September 1940			October–December 1940			January–March 1941			April–June 1941			July–September 1941			October–December 1941		
	Total	Women		Total	Women		Total	Women		Total	Women		Total	Women		Total	Women	
		Number	Percent		Number	Percent		Number	Percent		Number	Percent		Number	Percent		Number	Percent
Total	991,410	385,805	38.9	1,149,990	429,116	37.3	1,083,806	413,796	38.2	1,414,093	518,884	36.7	1,554,333	525,202	33.8	1,376,614	510,349	37.1
Professional and managerial	16,864	3,303	19.6	9,442	2,058	21.8	9,345	1,794	19.2	10,153	2,085	20.5	13,305	3,850	28.9	10,964	2,412	22.0
Clerical and sales	96,591	59,352	61.4	158,871	100,424	63.2	130,974	77,208	58.9	155,714	99,246	63.7	149,391	93,639	62.7	177,383	117,080	66.0
Service	312,152	226,849	72.7	332,952	237,188	71.2	342,160	250,262	73.1	470,904	304,277	64.6	446,037	303,239	68.0	426,666	292,047	68.4
Agricultural, forestry, and fishery	116,310	11,131	9.6	82,184	8,778	10.7	37,512	3,262	8.7	103,487	15,501	15.0	134,420	11,198	8.3	72,782	5,464	7.5
Skilled	86,993	8,056	9.3	124,625	6,789	5.4	132,196	7,943	6.0	126,647	8,768	6.9	139,583	7,047	5.0	122,599	6,088	5.0
Semiskilled	112,169	41,742	37.2	109,007	32,270	29.6	129,580	47,906	37.0	156,200	48,779	31.2	177,617	49,004	27.6	157,242	38,322	24.4
Unskilled	245,703	30,976	12.6	328,757	37,791	11.5	301,931	25,406	8.4	390,628	40,163	10.3	493,751	57,171	11.6	408,710	48,915	12.0
Unspecified	4,628	4,396	95.0	4,152	3,818	92.0	108	15	13.9	360	65	18.1	229	54	23.6	268	21	7.8

Table 4.—*Active file of men and women registrants at public employment offices, January 1940–May 1942*

Month and year	Total	Men	Women	
			Number	Percent
1940				
January	6,079,495	4,572,897	1,506,598	24.8
February	5,920,294	4,473,466	1,446,828	24.4
March	5,025,183	3,759,376	1,265,807	25.2
April	5,682,447	4,204,205	1,478,242	26.0
May	5,724,029	4,165,320	1,558,709	27.2
June	5,734,450	4,107,811	1,626,639	28.4
July	5,564,671	3,973,273	1,591,398	28.6
August	5,210,660	3,749,352	1,461,308	28.0
September	4,910,827	3,519,359	1,391,468	28.3
October	4,618,504	3,302,807	1,315,697	28.5
November	4,568,415	3,269,197	1,299,218	28.4
December	4,758,697	3,464,510	1,294,187	27.2
1941				
January	5,093,476	3,745,408	1,348,068	26.5
February	5,101,417	3,759,783	1,341,634	26.3
March	5,170,193	3,819,828	1,350,365	26.1
April	5,097,026	3,755,519	1,341,507	26.3
May	5,156,288	3,685,144	1,471,144	28.5
June	5,126,192	3,567,679	1,558,513	30.4
July	4,982,430	3,441,520	1,540,910	30.9
August	4,699,020	3,286,989	1,412,031	30.0
September	4,355,861	[1] 2,788,240	[1] 1,182,998	(1)
October	4,241,918	2,902,789	1,339,129	31.6
November	4,234,455	[1] 2,654,865	[1] 1,186,001	(1)
December	4,412,628	3,082,932	1,329,696	30.1
1942				
January	4,898,675	3,462,895	1,435,780	29.3
February	4,888,000	3,479,618	1,408,382	28.8
March	4,559,135	3,231,363	1,327,772	29.1
April	4,397,651	3,033,974	1,363,677	31.0
May	4,253,979	2,850,606	1,403,373	33.0

[1] Data by sex not reported for New York.

constituted 29–33 percent of all registrants.

A significant development reported by public employment offices in recent months has been the placement of women in occupations from which they were formerly excluded. In October and November, 37 women were first placed as engine-lathe operators. In those same months, 33 women were placed as multiple-spindle-drill-press operators; 274 women were placed as machine-shop floor assemblers; and jobs were found for 374 women detail assemblers in aircraft. Public employment offices first placed women as aircraft detail assemblers in August 1941, and placements have increased considerably since that date.

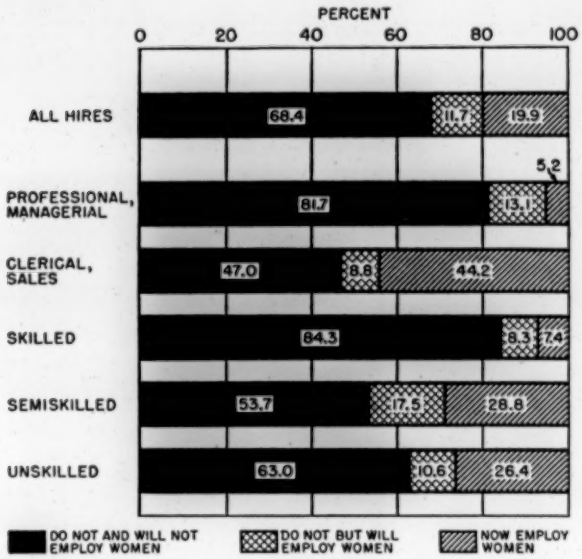
Interstate clearance orders reported by public employment offices show increasing requests for women workers, particularly in professional occupations. One large firm was reported willing to hire 100 women as organic chemists, a job usually closed to women. Another employer reported 200 openings for industrial engineers of either sex. Clearance orders were open to women in practically all engineering fields and in drafting work. In New Jersey there were clearance orders for 2,000 electricians and 2,000 radio repairmen of either sex. Among the occupations for which women are being considered in hundreds of openings for the first time are radio operators, tool makers, maintenance men, crystal grinders, electricians, and radio repairmen.

Employment Prospects in War Industries

Despite the indications that women are now being placed in some skilled occupations in which the shortage of qualified male workers is acute, no large-scale hiring of women workers for war production is expected before the end of 1942 unless employers further modify their specifications with respect to women. This conclusion is borne out by a special survey conducted by the Bureau of Employment Security in January 1942 of hiring anticipated by 10,700 war-industry establishments employing 5.1 million persons. These establishments anticipated hiring 676,000 additional workers by the end of June 1942. Asked whether they then employed women in those occupations in which openings would occur or, if not, whether they would employ them in the future, the responding employers indicated that in more than two-thirds of the jobs to be filled women were not and would not be employed. Only 20 percent of the anticipated openings were in occupations in which women were currently employed; less than 12 percent were in occupations in which women had not been employed up to that time but in which consideration would be given them (chart 2).

The extent to which women were currently employed in defense establishments varied considerably among occupational groups. Only 5.2 percent of the professional and managerial and 7.4 percent of the skilled-job openings were in occupations in which the reporting establishments already employed women, compared to 44 percent in clerical-and-sales occupations. Slightly more than one-fourth of the semiskilled and unskilled openings were in occupations in which women were already employed. More than four-fifths of the skilled and professional-and-managerial openings and well over half the semiskilled and unskilled jobs continued to be barred to women. Even among clerical-and-sales occupations, almost half the openings were with employers who would not consider women for such jobs, at least during the first 6 months of 1942.

Chart 2.—*Percentage distribution of anticipated hires in major occupational groups, by employer practice in hiring women in war industries, January–June 1942*

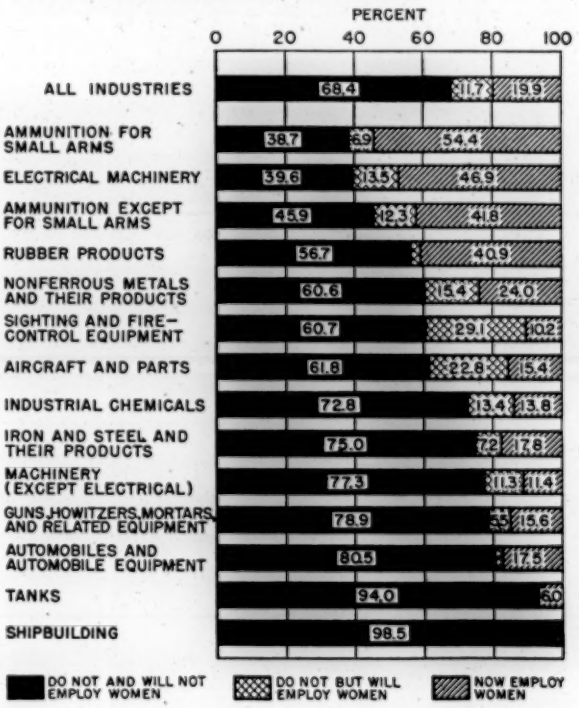


In spite of the increasing shortage of male labor, some relaxation of discrimination against women was indicated for only 12 percent of the reported openings. Thirteen percent of the professional-and-managerial and 18 percent of the semiskilled anticipated openings were in establishments which indicated that they did not but would employ women in the near future. Somewhat less relaxation of the discrimination was indicated for openings in the skilled categories, however, despite critical shortages in many skilled occupations.

Apparently, the decisive factor in determining the policy of an industry in hiring women is the degree of skill required of its workers (chart 3). With the exception of certain industries which cannot employ women in most jobs because of the heavy nature of the work, practically all industries which expected to hire large numbers of semiskilled and unskilled workers indicated a willingness to consider women. On the other hand, industries which demand mainly skilled workers reported few openings for which women would be hired. In the metal-working-machinery industry, for example, 53 percent of the anticipated openings were for skilled workers and only 19 percent for unskilled; employers in the industry reported that they employed women in only 9 percent of the jobs and that they did not and would not employ women in occupations constituting 77 percent of the job openings. The electrical-machinery industry, on the other hand, which anticipated hiring one-third skilled, one-third semiskilled, and one-third unskilled workers, reported that 47 percent of its openings would be in occupations in which women were already employed, 13 percent in which the industry would be willing to employ them, and only 40 percent in occupations where they could not be used. Industries in which a high proportion of the labor demand is for unit-skilled workers, as in the fireworks and ammunitions plants, also reported a relatively large proportion of the openings in occupations in which women were or would be employed.

The shipbuilding industry, because of the nature of the work, requires men for most of its operations. In some navy yards, however, women are now being employed for light production work. In one navy yard 200 women are being trained in sheet-metal work and 300 in machine operations and bench work. About a thousand women will be employed in this yard by the end of 1942. It

Chart 3.—*Percentage distribution of anticipated hires in selected war industries, by employer practice in hiring women, January-June 1942*



may be expected that private shipyards will employ women in greater numbers.

The aircraft-and-parts industry has been slow in hiring women compared to the progress made in Great Britain, where women have been doing 30–40 percent of the work in many plants and where official sources estimate that as much as 70 percent of the work could be done by women. Aircraft factories in the United States reported in January that only 15 percent of the industry's anticipated openings were in occupations in which women were then employed, and 23 percent were in occupations in which they were not then employed but would be considered. More than 60 percent of the total hires in the aircraft industry were in occupations in which employers stated that women were not and would not be employed, at least before July 1942.

Other industries indicating some relaxation of restrictions were the sighting and fire-control-equipment industry, professional-and-scientific instruments, fabricated-plastic products, nonferrous-metals, metal-office-furniture, and heating-apparatus industries.

Geographic variations in hiring practices seem to be caused primarily by the industrial characteristics of the areas concerned. In the Gulf States of Texas, Louisiana, Mississippi, and Alabama, 96 percent of the anticipated openings were in occupations closed to women; three-fourths of all the openings in the area were expected to be in the shipbuilding yards, blast furnaces, and foundries. In the New England area, on the other hand, the anticipated hires were distributed among a wide variety of industries, including many which do employ women, so that the hiring practices of the employers in this area closely approximate the national average. States which indicated relatively large proportions of openings in occupations in which women were or would be employed are States in which the hires of the ammunition industries predominate.

An examination of some of the reports for individual establishments indicates that some employers will not employ women in certain occupations in which other employers in the same industry and area do employ them or contemplate doing so. Although recent progress in this respect is encouraging, the survey indicates that considerable modification of employer restrictions against the hiring of women must still be achieved before the female labor supply is effectively utilized in the war effort.

The Training of Women

During the first period of the national defense training program, women were not encouraged to enroll for training, since there were more than enough male workers available. From July 1, 1941, through February 28, 1942, there were 32,100 women who had completed or were about to complete pre-employment training courses out of a total of 688,000, or 4.7 percent (table 5). Only 5,400 women, or less than 1 percent of 699,000, had received training supplementary to regular employment. The largest numbers of women were enrolled in machine-shop and aviation-service courses.

The limited number of women enrolled for training is the direct result of the failure of employers to relax their restrictions on the employment of women. Appropriations for defense training require that training be directed to specific needs of war producers. It is evident that, as long as men were available, women were not being enrolled in training courses, nor did placement data indicate that women were being placed in occupations in which training was necessary.

While a sizable increase has occurred during the past few months in the number of women receiving training, a great many steps must be taken to speed up the program so that a larger portion of the available labor force of women may be utilized for the war effort. Specifically, more women could be trained for occupations in electrical services, machine shop, and small parts assembly, to which women have been found to be readily adaptable. Such a training program must continue to be closely related to local conditions, however, as some areas still have backlogs of graduate trainees who have not yet been placed.

Aside from governmental defense training, private employers are also initiating courses for women. One large watch firm last October began training female inspectors in taking caliper and micrometer readings in order to replace male inspectors. The aircraft plants on Long Island, after a trial of women trainees, have decided to hire and train them and eventually will employ about 5,000 as sheet-metal workers, riveters, welders, assemblers, and inspectors. A Maryland

aircraft firm has employed several women trainees for light sheet-metal work, and in May was training 700 women as aircraft riveters and aircraft sheet-metal workers.

The public training program has already made a tremendous contribution to the war effort by preparing workers for war work through short pre-employment and refresher courses and supplementary courses designed to upgrade employed workers. The long-time apprenticeship program of the Department of Labor and the training at the college level by the engineering, science, and management defense training program administered by the Office of Education are designed to satisfy the need for skilled and professional workers. The problem at the present moment is one of timing and coordinating both the short-time and long-time phases of the training program with the war production program.

An analysis of the labor needs of war industries for the period January–June 1942 indicated that 60 percent of the anticipated openings were in occupations requiring 6 months or less of training time; 38 percent required not more than 2 months' training. On the other hand, 16 percent of all hires were in occupations requiring 6 months to a year of training, and 15 percent required more than 2 years. These data indicate that the great bulk of the unskilled and semiskilled needs of industry can be met in 2–6 months as soon as industry is ready to employ women in large numbers. The mass training of women in these short courses for unit-skilled occupations might not be practical, except in areas of current local stringency, until a substantial proportion of the 3.6 million [6] unemployed workers are absorbed, which will probably not occur until the end of 1942. But considerably more advance planning is necessary for the occupations—principally skilled and professional and managerial—which require longer training periods. This phase of the training program for women could well begin immediately, in anticipation of the period in 1943 and 1944 when industry will be more than anxious to employ qualified and trained women in any skilled or technical capacity.

Future Trend of Women's Employment

By the end of 1942, it is estimated that about 4.5 million women will be directly engaged in war work. While the number of women employed in the aircraft industry is still relatively small, it may be expected that before the end of the year the number will increase to possibly 200,000, if the industry modifies further its present hiring practices, as revealed by the special survey of January

[6] Estimate of the WPA for the week of March 8–14, 1942. Estimates for later months indicate a substantial decline from this number.

Table 5.—*Enrollment summary of pre-employment and refresher and supplementary courses, by type of course and sex, July 1, 1941–February 28, 1942*

Type of course	Cumulative enrollments in pre-employment and refresher courses						Cumulative enrollments in supplementary courses					
	Total [1]		Training concluded		In training Feb. 28, 1942		Total [1]		Training concluded		In training Feb. 28, 1942	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Total	655,622	32,075	496,061	21,085	159,561	10,990	693,164	5,432	518,818	3,250	174,346	2,182
Automotive services	22,426	397	18,033	351	4,393	46	34,151	22	27,539	21	6,612	1
Aviation services	188,927	11,542	146,459	7,530	42,468	4,012	183,574	1,837	138,905	1,037	44,669	800
Construction	5,428	75	3,519	64	1,909	11	5,310	2	4,118	2	1,192	0
Drafting and blueprint reading	7,859	758	6,918	483	941	275	56,026	978	40,871	572	15,155	406
Electrical services	15,811	915	12,554	662	3,257	253	14,765	86	10,389	52	4,376	34
Forging	2,611	11	1,931	11	680	0	328	1	296	1	32	0
Foundry	6,577	29	4,941	21	1,636	8	2,226	3	1,859	3	367	0
Machine shop	181,004	5,340	134,099	3,405	46,905	1,935	116,844	690	80,332	393	36,512	297
Patternmaking	7,705	224	6,397	194	1,308	30	5,153	57	3,925	57	1,228	0
Radio services	9,152	1,809	6,633	1,167	2,519	642	14,668	308	9,126	175	5,542	133
Riveting	1,624	26	1,505	26	119	0	212	0	174	0	38	0
Sheet metal work	27,263	1,014	21,802	690	5,461	324	9,457	84	7,331	60	2,126	24
Shipbuilding and boatbuilding	90,947	240	65,925	63	25,022	177	80,130	74	54,361	22	25,769	52
Welding	72,582	473	53,476	364	19,106	109	59,190	115	42,625	73	16,565	42
Woodworking	2,525	87	2,040	87	485	0	10,050	4	9,289	4	761	0
Other	13,181	[2] 9,135	9,829	[2] 5,967	3,352	[2] 3,168	101,080	[2] 1,171	87,678	[2] 778	13,402	[2] 393

[1] Not adjusted for persons dropping out.
[2] Consists largely of power sewing-machine courses.

Source: U. S. Office of Education, Vocational Training for Defense Workers, Research and Statistics Section.

1942. Similarly, in other armament industries, the number of women employed may be expected to increase rapidly as recruitment of male labor becomes more difficult.

In shell-loading and bag-loading plants, thousands of women have already been employed, and the tendency is toward the increased utilization of women workers, since much of the work in these plants requires little training and is suitable for women. There is also sufficient evidence that women are replacing men in the consumer-goods, retail-trade, and service industries and that the replacement will probably continue at an increasing rate.

Until recently, there have been few indications of the extension of agricultural employment to women. Some instances have been reported of the training of women to run tractors and other farm equipment during local seasonal shortages. Although some types of farm work are too strenuous for women, past experience has shown that they can do all the light work. In some areas, plans are in progress for training women not customarily engaged in agricultural work to aid in producing the necessary crops.

In mining, construction, and shipbuilding, men will continue to predominate, but women will gain sharply in the fields of transportation, power, communication, trade, apparel, and food processing, and in the hotel, restaurant, professional, and amusement industries.

With several million unemployed workers and no widespread labor shortage as yet, it will be some time before women are employed on a large scale everywhere. The unemployed and workers temporarily displaced by the conversion of industries to war work will have first consideration in employment. Where local labor shortages exist, increased efforts must be made to induce employers and labor to adopt policies that will ensure the full utilization of female labor. Jobs must be broken down into unit skills, workers will have to be upgraded, and women will need to be trained to fill the new jobs. By 1943, the demands of the victory program will require similar action in practically all areas.

Labor-Force Reserves

BARKEV S. SANDERS*

AS INDUSTRY EXPANDS under the impetus of war, it draws labor from among the unemployed and from groups which, but for the war, would not be engaged in gainful occupations. The new increments are of several kinds—the young who enter the labor force for the first time, those who have either completed or left schooling or training, the aged who reenter the labor force, the partially disabled and the handicapped who now can find jobs, housewives who had formerly been employed, and many others who have or have not formerly been in the labor force.

This report is addressed to some of the potentialities for further expansion of the labor force, particularly through the entrance of women into gainful employment.

When specific war plans take definite form, whether for the armed forces or for the production of munitions, the needs for labor can be foreseen with some precision, and the recruiting of personnel can go forward toward defined goals. But experience has amply shown that total needs cannot be reliably estimated by this method, because the nature and magnitude of the war effort change with the course of the war. Early forecasts of the needs for implements of war erred generally through being too low; some of the strains upon the labor supply which now impend were not foreseen then. It has therefore seemed wise to analyze our total potential human resources to meet industrial and military needs.

Estimates of the total potential labor supply with various kinds of subdivisions of the totals have been available for some time and from diverse sources. The special contribution of this study is in the statistical analysis of certain groups who, as need for their services arises, could augment the existing labor supply. This analysis was made possible by the availability from the family composition study of data concerning marital status and family and dependency relationships which could be applied to estimates of persons in the labor force and those not in the labor force. Data from the family composition study were used because census data were not yet available. The family composition study is based on the family relationships of approximately 2.5 million urban persons, selected as a cross section of the urban population, and 150,000 rural individuals. The information was obtained in the winter of 1935–36 by the U. S. Public Health Service through a house-to-house canvass in 83 cities in 18 States and 23 predominantly rural counties in 3 States.[1]

The primary objective of this article is to estimate the number of single, married, widowed, divorced, and separated women according to age and the number of children they have and the age composition of the children as indications of the availability of these women to augment the labor force. These estimates will not only indicate the extent to which the labor force may be increased but should also furnish guides as to problems involved in progressive expansion of the labor force and the relative facility with which various groups can make adjustments in their family life and domestic duties to enter gainful employment. The statistics may also indicate the magnitude of social adjustments which should be foreseen and the nature of social provisions which should be made to enable desired expansions in the labor force.

Employment Status of Persons Aged 14 and Over

Incidental to the primary purpose of this analysis, it has been necessary to develop estimates of the population of the continental United States for ages 14 and over according to age, sex, and employment status as of April 1, 1942. The assumptions underlying these estimates are presented briefly at the end of this article. The estimates are given in broad age classes in table 1, and the estimated increase in the labor force between April 1940 and April 1942 is summarized in table 2.

It is estimated that on April 1, 1942, there were 103.1 million persons aged 14 and over in the continental United States (table 1). Of these,

*Chief, Division of Health and Disability Studies, Bureau of Research and Statistics. The author wishes to acknowledge the assistance of William G. Madow and Joseph Steinberg.

[1] For analysis of data from this study, see Sanders, Barkev S., "Family Composition in the United States," *Social Security Bulletin*, Vol. 2, No. 4 (April 1939), pp. 9–13; other analyses have been carried from time to time in the Bulletin.

about 58.0 million, including about 84 percent of all males and 29 percent of all females aged 14 and over, were in the labor force, i. e., were employed in private or government work, including the armed forces, were on public emergency work, or were seeking work. Of the 45.1 million not in the labor force, about 8.1 million were attending school; 6.0 million were handicapped by age or physical defects or diseases; 1.3 million were institutionalized; and the largest segment, about 29.8 million, were "homemakers." [2] The last group contains by far the greatest part of the potential laborpower for future expansion of the labor force.

The 103.1 million were almost equally divided between males and females. A little more than 8 million of the males were not in the labor

[2] "Homemakers" includes the census classifications of females "engaged in own home housework" and "other"; 97 percent are estimated to be in the former category. See Bureau of the Census, *Instructions to Enumerators—Population and Agriculture 1940*, p. 56.

Table 2.—*Sources of increase in the labor force between April 1, 1940, and April 1, 1942, according to sex* [1]

[In thousands]

Labor force in 1940 and 1942 and source of increase	Total	Male	Female
Estimated number of persons 14 years and over in the labor force, Apr. 1, 1942	58,015	43,164	14,851
Number of persons 14 years and over in the labor force, Apr. 1, 1940 [2]	53,496	40,419	13,076
Total estimated increase, Apr. 1, 1940, to Apr. 1, 1942	4,520	2,745	1,775
Increases due to population changes	1,079	812	268
Increases due to added demand for labor	3,441	1,934	1,507
Males under age 65 (exclusive of school withdrawals)	911	911	.....
Females under age 60 (exclusive of school withdrawals and delayed retirement, entry, or reentry into labor force over age 50)	852	.....	852
Withdrawals from school	1,196	734	462
Males aged 65–74—delayed retirement and reentry into labor force	288	288	.....
Females aged 50–74—delayed retirement and entry or reentry into labor force	194	.....	194

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures.
[2] Size of labor force differs from that given by the 1940 census, Release Series P-4, No. 8, because 1,789,144 persons of unknown employment status were distributed in accordance with percentage distribution for persons of known employment status on Apr. 1, 1940.

Table 1.—*Estimated number of persons 14 years and over in the continental United States, by age group, sex, and employment status, and percentage distribution by employment status, April 1, 1942* [1]

[In thousands]

Age group	Estimated number of persons							Percentage distribution						
	Total	In labor force	Not in labor force					Total	In labor force	Not in labor force				
			Total	Homemakers	In school	Unable to work	In institutions			Total	Homemakers	In school	Unable to work	In institutions
Both sexes														
Total	103,127	58,015	45,112	29,752	8,105	5,974	1,282	100.0	56.3	43.7	28.8	7.9	5.8	1.2
14–19	14,369	5,429	8,940	1,154	7,535	126	125	100.0	37.8	62.2	8.0	52.4	.9	.9
20–24	11,770	8,277	3,493	2,762	489	138	104	100.0	70.3	29.7	23.5	4.1	1.2	.9
25–44	40,618	26,194	14,424	13,339	81	564	441	100.0	64.5	35.5	32.8	.2	1.4	1.1
45–64	26,780	15,466	11,314	9,610	.....	1,333	370	100.0	57.8	42.2	35.9	.....	4.9	1.4
65 and over	9,591	2,649	6,941	2,886	.....	3,814	242	100.0	27.6	72.4	30.1	.....	39.8	2.5
Male														
Total	51,513	43,164	8,349	.....	3,999	3,527	823	100.0	83.8	16.2	.....	7.8	6.8	1.6
14–19	7,225	3,407	3,818	.....	3,676	64	78	100.0	47.2	52.8	.....	50.9	.9	1.0
20–24	5,783	5,359	424	.....	279	69	76	100.0	92.7	7.3	.....	4.8	1.2	1.3
25–44	20,195	19,525	670	.....	44	321	304	100.0	96.7	3.3	.....	.2	1.6	1.5
45–64	13,638	12,596	1,042	.....	.....	805	238	100.0	92.4	7.6	.....	.....	5.9	1.7
65 and over	4,672	2,276	2,396	.....	.....	2,269	127	100.0	48.7	51.3	.....	.....	48.6	2.7
Female														
Total	51,614	14,851	36,763	29,752	4,106	2,447	458	100.0	28.8	71.2	57.6	8.0	4.7	.9
14–19	7,144	2,022	5,122	1,154	3,859	62	47	100.0	28.3	71.7	16.1	54.0	.9	.7
20–24	5,987	2,918	3,069	2,762	211	69	28	100.0	48.7	51.3	46.1	3.5	1.2	.5
25–44	20,423	6,669	13,755	13,339	36	243	136	100.0	32.7	67.3	65.3	.2	1.2	.6
45–64	13,142	2,870	10,271	9,610	.....	529	132	100.0	21.8	78.2	73.2	.....	4.0	1.0
65 and over	4,919	373	4,546	2,886	.....	1,545	115	100.0	7.6	92.4	58.7	.....	31.4	2.3

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures; percentage distributions computed from unrounded figures.

force. The group consisted exclusively of those in school, those unable to work, and a residual group of less than 1 million in institutions. The men not in the labor force are predominantly the very young and the very old—only about 1.1 million were in the age group 20–44. The outlook for further recruitment for the labor force from these 8.3 million men is limited.

Nearly 37 million women were outside the labor force; of these, about 29.8 million were homemakers, 4.1 million were in school, about 2.4 million were unable to work, and nearly half a million were in institutions. Appreciably more than half the 29.8 million homemakers were aged 20–44, and more than nine-tenths were under age 65. Obviously, this is the group from which most of the expansion of the labor force must come, and it is therefore important to explore further their marital and parental status. It will be of interest also to examine the marital and parental status of women who are already in the labor force.

Marital and Parental Status of Women in the Labor Force and of Homemakers

In addition to basic tables on marital and parental status of women derived from the urban and rural samples of the family composition study, special tabulations were prepared using 10 percent of the urban sample to provide a more detailed analysis by employment status and by numbers of children in specified age groups. The respective ratios of single, married, and widowed, divorced, and separated women with specified numbers of children were applied to the estimated number of women in the labor force as of April 1, 1942, and to the estimated number of homemakers in urban and rural nonfarm areas. The rural sample was applied to estimates of rural-farm groups based on the 1940 census, without allowances for migration which occurred between 1940 and 1942. For the distribution of the number of women with children in specified ages, the 10-percent urban sample was used exclusively.

Of the nearly 15 million women in the labor force as of April 1, 1942, only about 3 million or less than 21 percent are married (table 3). Two-thirds of these married women have no children under 16 years of age, and of the remaining third more than half have only one such child. Only 15 percent of all the married women in the labor force have two or more children under age 16. About 3.8 million or 26 percent of the 15 million women are widowed, divorced, or separated.[3]

[3] For the rest of the article, the terms "widowed" or "widows" will be used to denote the group "widowed, divorced, or separated."

Table 3.—*Estimated number of women 14 years and over in the labor force, by age group, marital status, and number of children under 16, and percentage distribution by marital status and number of children, April 1, 1942* [1]

[In thousands]

Age group	Total	Married						Widowed, divorced, or separated						Single
		Total	With specified number of children					Total	With specified number of children					
			None	One	Two	Three	Four or more		None	One	Two	Three	Four or more	
	Number													
Total	14,851	3,074	2,054	568	270	106	76	3,847	2,801	634	253	94	65	7,931
14–19	2,022	63	49	12	1	(2)	0	50	24	23	3	(2)	0	1,909
20–24	2,918	364	285	56	18	5	1	198	106	64	21	5	1	2,356
25–44	6,669	2,003	1,194	424	227	90	68	1,843	1,085	429	196	76	57	2,823
45–64	2,870	614	497	75	24	11	7	1,492	1,323	117	33	13	7	764
65 and over	373	30	29	(2)	(2)	0	0	263	262	1	(2)	0	0	80
	Percentage distribution													
Total	100.0	20.7	13.9	3.8	1.8	0.7	0.5	25.9	18.9	4.3	1.7	0.6	0.4	53.4
14–19	100.0	3.1	2.4	.6	.1	(2)	0	2.5	1.2	1.1	.2	(2)	0	94.4
20–24	100.0	12.5	9.8	1.9	.6	.2	(2)	6.8	3.7	2.2	.7	.2	(2)	80.7
25–44	100.0	30.1	17.9	6.4	3.4	1.4	1.0	27.6	16.3	6.4	2.9	1.1	.9	42.3
45–64	100.0	21.4	17.3	2.6	.9	.4	.2	52.0	46.0	4.1	1.2	.4	.3	26.6
65 and over	100.0	7.9	7.9	(3)	(3)	0	0	70.6	70.4	.2	(3)	0	0	21.5

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures; percentage distributions computed from unrounded figures.

[2] Less that 500.

[3] Less than 0.05 percent.

Nearly three-fourths of these have no children, and of those with children three-fifths have only one child under 16. More than 53 percent of the women in the labor force are single. Table 3 indicates the extent to which the female labor force is composed of single women, women with no children, or women with only one child under age 16.

The deterrent effect of family responsibilities upon the participation of women in the labor force is most apparent among those who have children under 5 years of age (table 4). The relatively small proportion who have children under 5 or 5–9 years of age is indicated by the following percentages, derived from table 4:

Marital status and number of children	Number	Percent			
		Total	At least one child under 5 years	No child under 5; at least one child 5–9 years	No child under 10; at least one child 10–15 years
Married women with—					
One child	568,000	100.0	25.7	24.6	49.7
Two children	270,000	100.0	28.9	39.3	31.8
Three children	106,000	100.0	36.8	40.6	22.6
Four or more children	76,000	100.0	57.9	36.8	5.3
Widowed, divorced, or separated women with—					
One child	634,000	100.0	18.8	21.8	59.4
Two children	253,000	100.0	21.7	37.2	41.1
Three children	94,000	100.0	24.5	48.9	26.6
Four or more children	65,000	100.0	43.1	50.8	6.1

In summary: of the 1.1 million married women in the labor force with one or more children under 16 years of age, only 30.1 percent have at least one child under age 5; 31.1 percent have no child under age 5 but one or more children aged 5–9; the balance, 38.8 percent, have no child under 10. Of the 1.0 million widows in the labor force with one or more children under 16 years of age, only 21.5 percent have at least one child under 5 years of age; 29.7 percent have no child under 5 but one or more children 5–9 years of age; the balance, 48.8 percent, have no child under 10 years of age.

Of the 29.8 million homemakers who constitute the principal potential supply for the future expansion of the labor force, almost 79 percent are married (table 5), in contrast to the less than 21 percent found among the women in the labor force (table 3). Of the married women not in the labor force (the homemakers), more than half—in contrast to the third found in the labor force—have one or more children. Some 43 percent of these homemakers with one or more children have only one child; 29 percent, two children; 14 percent, three children; and 14 percent have four or more children under 16 years of age. Only 15 percent of the homemakers are widowed. Of these, 83 percent have no children under 16 years of age. Of those with one or more children, 53 percent have one child, 25 percent have two children, 12 percent have three children, and 10 percent have four or more children. Finally, only about 6 percent of the homemakers are single, in contrast to the more than 53 percent found among women in the labor force.

Table 6 gives the number of married and of widowed homemakers with one or more children under age 5, 5–9, and 10–15. The summary findings from the table are indicated below:

Marital status and number of children	Number	Percent			
		Total	At least one child under 5 years	No child under 5; at least one child 5–9 years	No child under 10; at least one child 10–15 years
Married women with—					
One child	5,473,000	100.0	38.1	20.5	41.4
Two children	3,642,000	100.0	45.6	31.4	23.0
Three children	1,812,000	100.0	54.1	36.2	9.7
Four or more children	1,727,000	100.0	74.4	24.3	1.3
Widowed, divorced, or separated women with—					
One child	391,000	100.0	21.0	15.3	63.7
Two children	186,000	100.0	23.4	31.4	45.2
Three children	85,000	100.0	30.6	43.5	25.9
Four or more children	74,000	100.0	51.3	41.9	6.8

Of all the 12.7 million married homemakers with one or more children under 16 years of age, 47.5 percent have at least one child under 5 years of age, 26.4 percent have no child under 5 but at least one child aged 5–9, and 26.1 percent have children 10–15 years of age. Of the 738,000 widowed homemakers with one or more children under 16 years of age, 25.8 percent have at least one child under 5 years of age, 25.3 percent have no child under 5 but one or more children in ages 5–9, and 48.9 percent have children aged 10–15.

The greater relative frequency of young children among homemaker mothers compared with mothers in the labor force is emphasized in the summary percentages of mothers with one or more children under 5, 5–9, and 10–15 years of age, according to the marital and labor-force status of the mother:

Marital status	At least one child under 5 years	No child under 5; at least one child 5–9 years	No child under 10; at least one child 10–15 years
In labor force:			
Married	30.1	31.1	38.8
Widowed, divorced, or separated	21.5	29.7	48.8
Homemakers:			
Married	47.5	26.4	26.1
Widowed, divorced, or separated	25.8	25.3	48.9

Labor Potential

If a large proportion of the mothers with young children can be persuaded to participate in the labor force, provision must be made for the care of their children, especially for those less than 5 years of age.

The analysis of the marital and parental status of the homemakers indicates that there are nearly 2 million single persons, among whom a large fraction may be available for gainful work provided they live in areas where there are suitable opportunities for employment and appropriate inducements. It should be noted that less than 1.5 million of these are in ages 14–44; the remainder are older and as a group probably less adaptable to gainful work (table 5). Furthermore, an unknown proportion of these single women may have family responsibilities, such as caring for aged or disabled members of the family or caring for young children in the household. Next to the single group, the group with the highest potential recruitment to the labor force are the married women who have no children under 16 years of age. There are nearly 11 million of these, though less than 4.5 million are less than 45 years of age. About half the group are aged 45–64, and nearly 1 million are aged 65 and over. In view of the likelihood that married men without children will be drafted in increasing numbers, it is probable that many of the younger women in this group will be in need of gainful work and will be available for such work if suitable opportunities for employment are offered to them.

Table 4.—*Estimated number of married women and of widowed, divorced, or separated women 14 years and over in the labor force, by age group and by number and age group of children under 16, April 1, 1942* [1]

[In thousands]

Number of children and age group	Married						Widowed, divorced, or separated					
	Total	14–19	20–24	25–44	45–64	65 and over	Total	14–19	20–24	25–44	45–64	65 and over
Total	3,074	63	364	2,003	614	30	3,847	50	198	1,843	1,492	263
Women without children	2,054	49	285	1,194	497	29	2,801	24	106	1,085	1,323	262
Women with children	1,020	14	80	809	117	(2)	1,046	26	91	757	170	1
No child under 5 and—												
None 5–9:												
One 10–15	282	0	(2)	216	65	(2)	377	0	2	268	106	1
Two 10–15	86	0	(2)	65	20	(2)	104	0	0	79	25	(2)
Three 10–15	24	0	0	17	6	0	25	0	0	17	8	0
Four or more 10–15	4	0	0	1	3	0	4	0	0	2	2	0
One 5–9:												
None 10–15	140	0	9	122	9	0	128	(2)	18	109	10	0
One 10–15	70	0	(2)	67	2	0	65	0	1	59	6	0
Two 10–15	29	0	0	26	3	0	30	0	0	26	4	0
Two 5–9:												
None 10–15	36	0	1	34	1	0	29	0	3	25	1	0
One 10–15	8	0	0	8	1	0	10	0	0	9	1	0
Three 5–9:												
None 10–15	6	0	0	6	1	0	6	0	(2)	6	0	0
Four or more, at least one 5–9	28	0	0	26	3	0	33	0	0	28	5	0
One child under 5 and—												
None 5–9:												
None 10–15	146	12	46	86	1	0	119	23	44	52	1	0
One 10–15	15	0	0	14	1	0	10	0	0	9	1	0
Two 10–15	7	0	0	7	1	0	2	0	0	2	0	0
One 5–9:												
None 10–15	41	0	5	36	0	0	27	0	8	18	1	0
One 10–15	7	0	0	7	0	0	5	0	0	5	0	0
Two 5–9:												
None 10–15	12	0	(2)	12	0	0	6	0	(2)	5	0	0
Two children under 5 and —												
None 5–9:												
None 10–15	22	1	11	11	0	0	18	3	9	6	0	0
One 10–15	1	0	0	1	0	0	1	0	0	1	0	0
One 5–9:												
None 10–15	8	0	2	6	0	0	5	0	2	3	0	0
Three children under 5 and —												
None 5–9:												
None 10–15	4	(2)	3	1	0	0	4	(2)	3	1	0	0
Four or more children, at least one under 5	44	0	1	41	1	0	28	0	1	27	(2)	0

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures.

[2] Less than 500.

Next perhaps in the order of proportionate availability for the labor force are the married women and the widows who have only one or two children over age 10 (table 6). There are 3.4 million women in these two groups, of whom 57.3 percent are less than 44 years old and almost none are over 65. It may be assumed that persons in these groups are more likely to be prospective gainful workers than widows without children, since nearly half of the approximately 4 million widows without children are aged 65 and over. The homemakers in certain broad classes in the order of their probable availability for gainful work are listed as follows:

Marital status and number of children	Women (in thousands) in age group			
	Total	Under 45	45–64	65 and over
Total	29,752	17,255	9,611	2,886
Single	1,893	1,432	317	144
Married, without children under age 16	10,726	4,346	5,408	972
Married, with not more than two children, and none under 10 years of age	3,102	1,831	1,267	4
Widowed, divorced, or separated, with not more than two children, and none under 10 years of age	334	138	193	3
Widowed, divorced, or separated, with no children under 16	3,739	288	1,689	1,762
All other homemakers	9,958	9,221	737	0

One may hazard some guesses as to the number that the groups listed above and the remaining employment groups, including the 8 million males, could yield to the labor force if the demand for additional workers continued to mount; if 10–12 million men, including many married men with dependents, were drafted into the armed forces; if there were a vigorous administrative policy of using our human resources to the maximum; if wages were very attractive and provision were made for the care of young children through day nurseries and other expedients; and if there were other inducements for women to engage in gainful work. Under such circumstances, perhaps 75 percent of the single homemakers; 50 percent of the married homemakers with no children under 16; 35 percent of the married and the widowed with not more than two children and none under 10 years of age; 25 percent of the widows who have no children; and 10 percent of all the remaining homemakers might enter the labor force. These would mean an increase of about 10 million; probably another million or a million and a half could be derived from the remaining employment-status groups—those attending school and those "unable to work." The institutional group is not likely to make any contribution except through prison labor, and even there the contribution is bound to be small. In

Table 5.—*Estimated number of women homemakers 14 years and over, by age group, marital status, and number of children under 16, and percentage distribution by marital status and number of children, April 1, 1942* [1]

[In thousands]

Age group	Total	Married						Widowed, divorced, or separated						Single
		Total	With specified number of children					Total	With specified number of children					
			None	One	Two	Three	Four or more		None	One	Two	Three	Four or more	
	Number													
Total	29,752	23,381	10,726	5,473	3,642	1,812	1,727	4,478	3,739	391	188	85	74	1,893
14–19	1,154	463	255	177	28	3	1	37	14	20	2	1	0	654
20–24	2,762	2,268	849	855	390	132	42	94	31	42	15	4	2	400
25–44	13,339	12,324	3,242	3,321	2,763	1,470	1,530	637	244	162	114	57	59	378
45–64	9,610	7,349	5,408	1,117	461	208	155	1,945	1,689	164	56	23	13	317
65 and over	2,886	977	972	4	(2)	(2)	(2)	1,765	1,762	3	(2)	(2)	(2)	144
	Percentage distribution													
Total	100.0	78.6	36.1	18.4	12.2	6.1	5.8	15.0	12.6	1.3	0.6	0.3	0.2	6.4
14–19	100.0	40.1	22.1	15.3	2.4	.2	.1	3.2	1.2	1.7	.2	.1	0	56.7
20–24	100.0	82.1	30.7	31.0	14.1	4.8	1.5	3.4	1.1	1.5	.6	.1	.1	14.5
25–44	100.0	92.4	24.3	24.9	20.7	11.0	11.5	4.8	1.8	1.2	.9	.4	.5	2.8
45–64	100.0	76.5	56.3	11.6	4.8	2.2	1.6	20.2	17.6	1.7	.6	.2	.1	3.3
65 and over	100.0	33.8	33.7	.1	(2)	(2)	(2)	61.2	61.1	.1	(2)	(2)	(2)	5.0

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures; percentage distributions computed from unrounded figures.

[2] Less than 500.

[3] Less than 0.05 percent.

this respect, the contribution of men will be more significant. Thus the expected contribution to the labor force by women could be 11.0–11.5 million, provided suitable opportunities for work were available.

Another approach for guessing the maximum number of women who can be obtained to augment the labor force would be on the basis of the highest proportion of women found in the labor force in certain cities as given by the 1940 census. Using this approach, the Bureau of Employment Security has estimated the proportion of women in specified ages who may be available for gainful work.[4] These ratios applied to the estimated number of women in ages 14 and over in the United States give an estimate of 22.5 million women ultimately in the labor force. This total would seem easily attainable under the circumstances assumed above, involving an increase of only 7.6 million over the number estimated as already in the labor force on April 1, 1942. If one takes the highest proportion of women in the labor force for each specified age group in any city shown by the 1940 census—exclusive of Washington, D. C.—the estimate of the possible number of women in the labor force becomes 23.8 million. If one takes the highest observed percentages, including Washington, D. C., the total becomes 25.0 million—or an increase of about 10.1 million over the number already in the labor force on April 1, 1942.

Another rough guide as to the maximum availability of women for the labor force may be found in foreign experience both for World War I and for the present war. In 1913, 28.4 percent of the membership of German workers' sickness insurance were women—some 4.1 million persons; in 1915 this number had increased to 6.0 million; by 1918 it had reached the peak of 7.5 million.[5] In 1942, according to the present estimates, 25.6 percent of all persons in the labor force are women. It is conceivable that the number of women in the labor force in the United States could increase proportionately as much as the increase in the female membership of German sickness insurance funds, leading to an estimate of 26.8 million—an increase of 12.0 million. It may be assumed that, because of our sparser population and concentration of industries in certain areas and the lesser degree of regimentation, we may be unable to use our human resources as efficiently as Germany and therefore we may fall somewhat short of this goal. But it would seem reasonable that we can anticipate an increase of between 7 and 12 million women in the labor force and possibly of 1.5–2 million men, if all necessary measures short of compulsion are taken to facilitate their entry.

Whether we are able to approach only the minimum of this range or the maximum will be determined largely by the degree to which labor demand is widespread throughout the Nation so that those available for work can find suitable work in their communities; another important factor will be the effectiveness with which public opinion is mobilized. The importance of residence in relation to areas in need of workers is very great. In this respect, women in rural-farm areas are a special group, not only because they are available only for agricultural employment but because many of them are in fact in the labor force, in that their contribution is essential to the management of the farm. It is of interest, therefore, to indicate even crudely the number and the marital and parental status of women listed as homemakers in rural-farm areas. These are given in table 7, the estimates having assumed no urban-rural migration between 1940 and April 1, 1942. On the basis of these estimates, a somewhat higher proportion of these homemakers than of all the homemakers in the country are married, and a higher proportion are single. Among the married homemakers a higher proportion have children, and more of those with children have two or more children.

Unless our labor shortage becomes so acute that provision is made for large-scale migration of potential workers to areas experiencing acute labor shortages, very large segments of potentially available labor power cannot be used. But

[4] For a brief statement of the method used in these estimates, see "Estimating the Potential Expansion of the Female Labor Force in Urban Areas" in the Employment Security section of this issue.

[5] *Die Krankenversicherung 1934, Statistik des Deutschen Reichs*, Vol. 484, Berlin, 1936.

Table 6.—*Estimated number of married women homemakers and of widowed, divorced, or separated women homemakers, by age group and by number and age group of children under 16, April 1, 1942* [1]

[In thousands]

Number of children and age group	Married						Widowed, divorced, or separated					
	Total	14–19	20–24	25–44	45–64	65 and over	Total	14–19	20–24	25–44	45–64	65 and over
Total	23,381	463	2,268	12,324	7,349	977	4,478	37	94	637	1,945	1,765
Women without children	10,726	255	849	3,242	5,408	972	3,739	14	31	244	1,689	1,762
Women with children	12,655	208	1,419	9,083	1,940	5	738	23	63	393	256	3
No child under 5 and —												
None 5–9:												
One 10–15	2,266	2	3	1,279	977	4	249	0	0	97	149	3
Two 10–15	836	0	1	546	289	(2)	85	0	0	41	44	(2)
Three 10–15	176	0	0	117	60	(2)	22		0	12	11	(2)
Four or more 10–15	22	0	0	15	7	(2)	5	0	0	1	3	(2)
One 5–9:												
None 10–15	1,120	3	72	921	125	(2)	60	0	6	39	14	0
One 10–15	810	0	3	673	134	0	44	0	0	32	12	0
Two 10–15	402	0	1	295	105	0	23	0	0	16	7	0
Two 5–9:												
None 10–15	334	0	12	308	14	0	15	0	1	14	0	0
One 10–15	205	0	1	181	22	0	13	0	0	9	4	0
Three 5–9:												
None 10–15	48	0	1	47	(2)	0	1	0	0	1	0	0
Four or more, at least one 5–9	420	0	1	328	91	0	31	0	0	25	6	0
One child under 5 and —												
None 5–9:												
None 10–15	2,087	172	780	1,120	15	0	82	20	36	26	(2)	0
One 10–15	210	0	2	191	17	0	5	0	0	5	0	0
Two 10–15	113	0	1	104	9	0	3	0	0	3	0	0
One 5–9:												
None 10–15	781	1	84	690	6	0	20	0	3	16	(2)	0
One 10–15	214	0	2	206	6	0	7	0	0	7	1	0
Two 5–9:												
None 10–15	252	0	12	238	2	0	6	0	1	6	0	0
Two children under 5 and —												
None 5–9:												
None 10–15	671	27	288	355	1	0	19	2	10	6	0	0
One 10–15	30	0	1	27	2	0	0	0	0	0	0	0
One 5–9:												
None 10–15	251	(2)	58	192	1	0	7	0	2	5	0	0
Three children under 5 and —												
None 5–9:												
None 10–15	121	2	56	62	0	0	3	1	1	(2)	0	0
Four or more children, at least one under 5	1,285	1	41	1,186	57		38	0	2	33	3	0

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures.

[2] Less than 500.

Table 7.—*Estimated number of women homemakers 14 years and over in rural-farm areas, by age group, marital status, and number of children under 16, and percentage distribution by marital status and number of children, April 1, 1942* [1]

[In thousands]

Age group	Total	Married						Widowed, divorced, or separated						Single
		Total	With specified number of children					Total	With specified number of children					
			None	One	Two	Three	Four or more		None	One	Two	Three	Four or more	
	Number													
Total	7,022	5,613	2,376	1,200	840	532	665	743	576	87	43	17	20	667
14–19	479	177	94	70	11	1	1	15	6	7	1	1	0	287
20–24	791	603	193	210	127	54	19	28	11	11	5	1	1	160
25–44	2,985	2,723	567	610	557	405	585	131	46	34	25	10	16	131
45–64	2,227	1,872	1,286	309	145	72	61	286	231	33	12	6	4	69
65 and over	540	237	236	1	(2)	0	0	282	282	1	0	0	0	20
	Percentage distribution													
Total	100.0	79.9	33.8	17.1	11.9	7.6	9.5	10.6	8.2	1.2	0.6	0.3	0.3	9.5
14–19	100.0	36.9	19.7	14.6	2.3	.2	.1	3.2	1.4	1.5	.2	.1	0	59.9
20–24	100.0	76.2	24.4	26.6	16.1	6.8	2.3	3.6	1.4	1.4	.6	.1	.1	20.2
25–44	100.0	91.2	19.0	20.4	18.6	13.6	19.6	4.4	1.5	1.2	.9	.3	.5	4.4
45–64	100.0	84.1	57.7	13.9	6.5	3.3	2.7	12.8	10.3	1.5	.5	.3	.2	3.1
65 and over	100.0	44.0	43.8	.2	(2)	0	0	52.3	52.2	.1	0	0	0	3.7

[1] Totals represent sums of unrounded figures, hence may differ slightly from sums of rounded figures; percentage distributions computed from unrounded figures.

[2] Less than 500.

[3] Less than 0.05 percent.

whether or not the need ever becomes so urgent, a substantial number of women with young children could be drawn into the labor force, if appropriate provisions were made for the care of their children. Consideration of these and similar programs cannot be deferred to the future. While there is as yet no great labor stringency from the standpoint of the Nation as a whole, acute stringencies in certain areas are already apparent, and the number of such areas will presumably increase in the months to come. If acute shortages are to be avoided, the necessary plans should be drawn up in good time. Early action is essential since, in addition to developing appropriate provisions to make the women available for gainful work, allowance must be made for training time, since the vast majority will have no prior work experience or at least none of recent date or in requisite lines of work. It is hoped the data presented here on marital and parental status will be of some value in the development of policy and plans.

Technical Notes

Population Estimates

The changes in population for specified age-sex-race groups were obtained by subtracting from the (medium) population estimates of the National Resources Committee for 1945 the estimates for 1940.[6] These differences were converted into percentages, using the 1940 estimates as the base; four-tenths of the change thus obtained—2 years out of 5—was applied to the 1940 population given by the census in specified age-sex-race groups to estimate the population changes for the continental United States from April 1, 1940, to April 1, 1942. Adding these to the population enumerated in 1940 by the census gave the estimate of the population for April 1, 1942.

Increase in the Labor Force Through Population Changes and Added Demand for Labor

To determine the increase in the labor force as a result of population changes, the proportion of persons in the labor force in 1940 (after the proportionate distribution of those with unknown employment status), in specified age-sex groups, was applied to the estimated population of 1942; the result gave an increase of 1.1 million in the estimated labor force from 1940 to 1942. Those with unknown employment status were distributed proportionately, since it seemed improbable that all of them were outside the labor force. This distribution of the "unknown" increased the number of persons in the labor force in 1940 from 52.8 million to 53.5 million.

1. Increase of males in the labor force (including the armed forces).—In determining the increased proportion of males in ages under 65 in the labor force in 1942 over 1940 (exclusive of persons who withdrew from school to participate in the labor force), use was made of the increase in the number of applications for social security account numbers in 1941 over that in 1940. At the end of 1941, about 60 million account numbers had been issued. After subtracting from this the estimated number of persons with account numbers who had died since 1936 and the number who had retired as beneficiaries under old-age and survivors insurance, and making liberal allowances for duplicate account numbers, it would seem that at the end of 1941 there were more than 56 million account-number holders.

One could therefore assume that, with certain important exceptions, most persons who are more or less attached to the labor force already have account numbers, whether or not they are now working in covered employment. To the extent that this situation is approximated—and it is being approached very rapidly—any substantial increase in the annual number of applications for social security account numbers must indicate the entry of new workers into the labor force above the normal entry to take care of the annual turn-over. In other words, the number of applicants for account numbers can be considered to be composed of:

A. Normal turn-over cases which will remain essentially constant from year to year.

B. Shifts of noncovered persons who are in the labor force but without account numbers. This group should diminish progressively, approaching zero.

C. Enlargement of the labor force. It follows that before B has become relatively stationary, approximating zero, the applications for account numbers in 1 year will be less than applications for a preceding year unless C is large.

In 1940 there were 439,000 fewer male applicants for account numbers than in 1939. If employment conditions had remained the same, one would have anticipated a larger decrease in the number of applicants for account numbers in 1941 than the 1939–40 decrease; instead there was an increase of some 623,000.[7] Therefore, the number of applications for account numbers in 1941 was at least 1.1 million in excess of what would have been expected, an indication that there were many more than the normal number of new entrants into the covered labor force during the year 1941. These increases cannot be attributed merely to turn-over, since the number of both males and females with taxable wages was increasing progressively throughout 1941. Nor could these increases be accounted for merely in terms of a shift from noncovered to covered employment, since there is evidence that the number of workers in noncovered industry has not decreased.[8] Of the 1.1 million, some 600,000 were in ages over 20. There were, no doubt, additional workers entering the labor force, including the armed forces, who did not obtain account numbers within the first year of their entry into

[6] National Resources Committee: Population Statistics 1. National Data, October 1937, pp. 9–13, table 1.

[7] Excludes account-number holders of unknown age; therefore differs slightly from figures in table 5, Old-Age and Survivors Insurance section of this issue.

[8] Data on number and estimated earnings of persons in noncovered employment from U. S. Department of Commerce, Division of Foreign and Domestic Commerce.

the labor force or who already had account numbers. Assuming that there were at least some 200,000 of these, we have a net of 800,000 increase in the labor force in the ages 20–64. This increase would be still larger if the increment in the labor force for the first quarter of 1942 were taken into account.

With respect to the various groups not in the labor force, it was assumed that the greater part of this net increase must have come from males listed in the last census as "engaged in own home housework" (some 200,000 in ages 20–64) and from the group listed as "other" (about 500,000 in ages 20–64). The census definitions of these categories are as follows:

> "Engaged in own home housework" includes persons "primarily occupied during March 24–30 with own home housework, even though she (or he) may work for pay during the canning season, or Christmas season." "Other" includes: "(a) persons who work only during a short season of the year, such as a professional football player, and who were neither working nor seeking work during the week of March 24–30, 1940; (b) retired persons still able to work; (c) persons who choose not to work; and (d) persons able to work who for any other reason were not working, not seeking work, and without a job."

It was assumed that persons in these two groups were those most likely to be drawn first into the labor force; for the sake of simplicity both groups were completely transferred to the labor force for all ages under 65, giving a net increase of males in the lbaor force of 911,000. It is more reasonable to believe that some residue was left and that part of the increment in the labor force must have come from a shrinkage of the group "unable to work." But this assumption would have necessitated several intermediary guesses, which could be avoided if it is reasonably valid to assume that the general size of the increase was approximately correct and that most of it came from the two categories mentioned. To test the reasonableness of this estimated shift, the proportion of males in each quinquennial age group in the estimated labor force for 1942 was compared with the corresponding 1930 ratio of male gainful workers. It was found that in all age groups except that under 25 the ratios for 1930 were higher than for 1942, a finding which seemed reasonable, since the 1930 census did not count as gainful workers persons who were seeking work but who had had no prior work experience.

2. Increase of females in the labor force.—It was assumed that the increase from 1940 to 1941 of about 414,000 in the number of female applicants for account numbers in ages 20–59 represented the increased participation of women in covered employment in the labor force. The increase in the first quarter of 1942 was ignored to allow for turn-over and the higher rates at which women without account numbers may have shifted from non-covered to covered employment. To the increment derived from the larger number of applications was added an estimate of the number of women who entered the labor force for the first time without applying for account numbers. To estimate this number, usé was made of the proportion which women with taxable wages in an average quarter of 1940 in the different age groups were of the total number of women in the labor force. This ratio gave an estimated increase of 242,000 women who had entered the labor force because of the increased demand for labor and who had not applied for account numbers. Thus the total increase in the labor force was 656,000 women in ages 20–59, still exclusive of groups that withdrew from school to become engaged in gainful work; most of the latter were under 20 years of age. With respect to the group under age 20, it was assumed that 15 percent of the "homemakers" in ages 16–19 and 10 percent of those in ages 14–15 had also entered the labor force. The result was a total increase of 852,000 women shifting from the "homemakers" group to the labor force.

3. Increase resulting from school withdrawals.—In October 1941 the U. S. Office of Education surveyed, through mailed questionnaires, the decrease in public-school enrollment between October 1940 and October 1941. When the estimated decrease reported by communities of specified size was weighted, an average decrease of 3.5 percent in high-school enrollment was obtained. The junior high schools and elementary schools also showed decreases, though smaller than that observed for high schools. It was assumed that the decreases in high-school enrollment were all among pupils aged 14 and over, and it was further assumed that 20 percent of the high-school population was in ages under 14. On these bases the decrease among persons in ages, roughly, 14–18 was 4.3 percent. It was assumed that the rate of withdrawal for males was 1½ times that for females. On applying this rate to the 1940 school population the estimated percentage of withdrawals from school was found to be 3.4 for females and 5.1 percent for males. Even though the aggregate withdrawal rate from elementary schools and junior high schools was less than from high schools, it was believed that withdrawal of persons aged 14 and over from these schools was much higher than the withdrawal rate from high schools. On this basis the withdrawal rate for all persons in ages 14–18 was increased to 5 percent for females and 7 percent for males for the period October 1940–October 1941. These percentages gave an estimated withdrawal of 269,000 males and 194,000 females in ages 14–18. It was assumed that the withdrawal for the entire period, April 1, 1940–April 1, 1942, was twice as large as the withdrawal for 1940–41; and the estimates were accordingly 539,000 males and 387,000 females or a total of 926,000. All those who withdrew are assumed to have entered the labor force, including the armed forces. No allowance was made for decreases in the population in ages 14–18 from 1940 to 1942.

A recent publication [9] on the decrease of enrollment in colleges indicates an average decline of 9.2 percent in enrollment for 1941 compared with 1940. On this basis it was assumed that the withdrawal rate from school for those in ages 19–44 must have been at least 10 percent from 1940 to 1941.[10] It was further assumed that the rate of withdrawal among males was twice as large as among females. When these proportions were applied to the

[9] "Statistics of Attendance in American Universities and Colleges," *School and Society*, Vol. 54, No. 1407 (Dec. 13, 1941), pp. 539–540.

[10] A study made in 1941 by the Bureau of Labor Statistics, U. S. Department of Labor, concerning decreased college registration also yielded an estimate of approximately 10 percent.

1940 school population aged 19 and over, it was estimated that some 98,000 males and 37,000 females withdrew from school between October 1940 and October 1941. Again, it was assumed that the withdrawal for the 1940–42 period was twice as high as the estimated withdrawal for the period 1940–41. Therefore, the total decrease was taken as 195,000 for males and 74,000 for females. The aggregate school withdrawal for all age groups was 734,000 for males and 462,000 for females or a total of nearly 1.2 million.

4. Increase of the aged in the labor force.—For aged males, adjustments were made for ages 65–74, since the groups "engaged in own home housework" and "other," from which most of the additions would have come in younger ages, had been entirely shifted to the labor force and it was deemed unwarranted to make further adjustments at this time for the group "unable to work" in ages under 65. It was assumed that the increase in the labor force had resulted from (a) retardation in retirement, and (b) return to the labor force after retirement. To estimate the effect of delayed retirement on the increase of the labor force, it was assumed that, on the average, the proportion of persons in the labor force for a specified age would be the ratio of persons 2 years younger found in the 1940 census. These proportions for ages 63–72 were applied to the total male population at each single year of age for ages 65–74 to obtain an estimate of the labor force for ages 65–74. The difference between the estimates thus obtained and the 1940 census was assumed to indicate the results of 2 years' delay in retirement; since it was assumed that the increased labor demand has in general been effective for a year and a quarter only, five-eighths of the increase computed above, or 168,000, was taken as representing the actual net increase in the labor force.

To estimate the number of males returning from retirement it was necessary first to estimate the number of persons who had retired. Ratios were obtained from the family composition study for the age groups 65–69 and 70–74 of those "retired" to the sum of the "retired" plus the "disabled." For each of the two age classes, the ratios obtained were applied to the estimated number of persons classed as "unable to work" plus "other" obtained by applying the census ratios to the population estimate for April 1, 1942. This procedure was followed on the assumption that, under the census definition, many retired persons in advanced ages reported themselves as "unable to work" and only a fraction of them reported themselves in the class "other." This adjustment gave for each age group an estimate of the retired males—a total of 1.2 million.

Data obtained from old-age and survivors insurance records were used to estimate the proportion of retired persons who had returned to covered employment between April 1, 1940, and April 1, 1942. On December 31, 1941, out of 222,817 primary beneficiaries entitled to benefits, 20,000 or 9 percent were employed in covered jobs during the month. On the basis of this evidence, it was guessed that at least 10 percent of the 1.2 million retired males in ages 65–74 or about 120,000 persons had returned to the labor force. This estimate combined with that for persons who postponed retirement gave a total of 288,000 males in ages 65 and over as the addition to the labor force as of April 1, 1942.

The increase of the labor force through greater participation of females in ages 50–74 was estimated in parallel fashion. It was assumed that only 8 percent of the females in ages 50–74 not in the labor force had entered the labor force after April 1, 1940. The estimated total increase for women in these ages was 194,000—105,000 from postponing retirement and 89,000 new entrants and reentrants in the labor force.

5. Recapitulation of the increases in the labor force.—Table 2 recapitulates these increases and shows the comparative size of the labor force in 1940 and 1942. Since the preliminary estimates were completed, they have been checked against other available estimates. The over-all estimate of the labor force—58 million—is believed reasonable. There has probably been an overestimation of school withdrawals but somewhat of an underestimation of the number of males and females in intermediate ages, and possibly of females in older ages who have entered the labor force. These differences are so minor, compared to the totals, that recomputing the estimates would not have been warranted.

The Family Composition Study

Data used in the family composition study are based on schedules obtained by the U. S. Public Health Service in conducting the National Health Survey. The schedules were filled out by a house-to-house canvass in the winter of 1935–36 in 83 cities and 23 primarily rural counties in Georgia, Missouri, and Michigan. The urban sample included cities from 18 different States. (See footnote 1.)

In the present estimates developed by applying data from the family composition study both the urban and rural samples were used. With respect to the number of children in specified ages under 5, 5–9, and 10–15, a 10-percent urban sample was the only basis. In the family composition study, married women included only women living with their husbands; women in households from which the husband was absent or missing were classed as "separated" and combined within the category "widowed, divorced, or separated." Only such children were enumerated in the family as were living with the family; children attending school or away from home were omitted. The term "children" comprised natural children, adopted children, or foster children under 16 years of age.

There may be some objection to the appropriateness of having applied the data from the family composition study to the present analysis, because of the passage of time since that study was made. There are indications that marriage rates have continued to increase since 1935 and there has been a perceptible upward change since 1937 in the birth rate. The estimates of women with children under 5 years of age may therefore be somewhat low, and similarly the estimated proportion of married women in the population; but, on the whole, it is doubtful that the consequent error from these elements of possible bias could be such as to affect substantially the over-all end results. Moreover, as the war continues, marriage rates are likely to decline sharply and the birth rate is also

likely to fall, thus giving results which may be expected to come into closer harmony with the estimates given here on the basis of 1935–36 observations.

In this connection, an estimate of the number of persons under 16 years of age obtained from the family composition study was found to be nearly 5 percent lower than an estimate of the population in these ages based on the estimates of the National Resources Committee and the 1940 census. This underestimate would have been less if a higher proportion of married women and women with children were assumed in the 1942 labor force, as would have been reasonable.

A more important limitation concerns the comparability of the marital and parental status of women in the labor force in 1942 and of gainful workers in 1935–36. Undoubtedly the marital and parental composition of women who would not have been in the labor force but for the present exigency differs from that of women regularly in the labor force. The size of the errors on these scores is probably more serious, and they probably operate to give a somewhat lower proportion of married women in the labor force in 1942 than would be found if an enumeration were made. But even these errors are probably too small to distort the resulting estimates as a gauge of the general magnitudes involved, which are sufficient for policy-forming purposes.

Wartime Federal Civilian Employees and Old-Age and Survivors Insurance

D. C. BRONSON *

MOST JUSTIFIABLY, members of the armed forces have received, and are receiving, legislative attention in matters relating to pay,[1] benefit programs,[2] and relief from civilian obligations.[3] Federal acts and orders have increased the serviceman's base pay, granted Government allowances to his dependents, provided the higher war rates for death and disability benefits administered by the Veterans Administration, made available the inexpensive protection of National Service Life Insurance, and established various forms of relief, moratoria, and deferments of obligations incurred in his previous civilian status. Moreover, some 40 State legislatures have amended their unemployment compensation laws to freeze or protect his benefit rights for the period of his military service.

Although no similar measures have as yet been taken to protect the serviceman's acquired rights under old-age and survivors insurance, the problem was recognized when selective service began operation and has frequently been mentioned in Congress as one which needs solution. Various plans have been suggested,[4] such as a complete moratorium, to eliminate rights to benefits during his period of service while freezing his existing benefit status for resumption without penalty upon his return to private life; an incomplete moratorium, which would hold open during his service period eligibility to benefit for his survivors while his existing benefit status was frozen; automatic granting of insured status to service men, perhaps dependent on their having previously worked in covered employment; or direct extension of old-age and survivors insurance coverage to all the armed forces. One of the difficulties is to find a satisfactory method of coordinating the amount of benefits and period of coverage with the corresponding provisions of the Veterans Administration program, to prevent, for one thing, an undesirable duplication of survivor payments and, perhaps later, disability benefit payments. Certainly the man should not suffer upon his return to private life either by lapse of his insured status or reduction in his covered average wage on account of his service in the armed forces. Perhaps this problem will not be increased by some delay since, because of the various provisions for his family if he dies while in the service, the time at which the needed old-age and survivors insurance amendment should be directed is when the man leaves the forces and resumes, or is ready and available to resume, employment in private industry.

The situation among the civilian employees of the Government, particularly among those we might call the "duration employees," presents a different picture. There are no veterans' benefits, no National Service Life Insurance, no family allowances, no civilian relief measures; the States have set up no safeguards to preserve unemployment compensation rights; nor has Federal legislation been introduced or specifically promised with respect to continuity of credits and maintenance of protection under old-age and survivors insurance. There are probably valid arguments for this variation in the treatment of civilians, except for the last. Civilians presumptively do not run equal risks with servicemen as to death and disability; civilians usually voluntarily seek and leave their Government jobs; civilians are better paid and more able to provide their own protection, savings, and so on, and to maintain their civil obligations and relationships. There is nothing, however, that they are able to do voluntarily, or with Government cooperation, to prevent their Federal employment from causing a gap in their social security protection, a gap which widens with each day on the Federal pay roll.

In the Bulletin for May 1940, the writer discussed the advantages which would accrue to public employees if coverage under the Social

* Office of the Actuary.

[1] Public, No. 607, 77th Cong., Public, No. 625, 77th Cong., and Public, No. 490, 77th Cong.

[2] See provisions for death and disability benefits through the Veterans Administration, including protection under the National Service Life Insurance Act of 1940.

[3] Public, No. 861, 76th Cong.

[4] See Tate, Jack B., "The Contemplated Federal Provisions for Men in the Army and Their Families," an address presented at the National Conference of Social Work, Atlantic City, June 3, 1941.

Security Act were extended to them, and the resulting increase in the effectiveness of the Social Security Act as an instrument for the general welfare. Such extension, together with the inclusion of other groups whose employment is not now within the purview of the act, has been consistently advocated by the Advisory Council, the Social Security Board, and the President. Opposition has been met from some public-employee groups, and in certain other quarters. Without injecting those arguments into the present article, let us assume for purposes of discussion that it is not yet feasible to extend old-age and survivors insurance coverage to the whole area of Federal employment. What then of the hundreds of thousands of individuals who during the last few years have come to Federal civilian defense jobs from private covered employment, to which most of them will return? They should not be permanently penalized by the effect of this Federal employment on their insured status. An indication of the magnitude of the problem in terms of the number of employees involved can be seen from data on the absolute and relative increases in certain major war agencies and in the total executive branch of the Federal Government (table 1). Since the increase shown is net, the gross number of new entrants already far exceeds 1 million persons. One recent newspaper account,[5] allegedly based on statistics from the Civil Service Commission, claims gross placements during the fiscal year 1941–42 alone of 1.5 million persons, as a result of a very high rate of current turn-over.

It is true that, of the more than 2 million persons now in Federal employment, probably 85–90 percent are members of a retirement plan, mainly the civil-service system. The amendments to the Civil Service Retirement Act, effective January 24, 1942, broadened the scope of its membership, although Executive Order No. 9154 of May 1, 1942, excluded an unknown number of persons (probably 200,000 or 300,000) in various types of temporary intermittent, fee, and piece-work services. It is also true that members of the civil-service system who obtain 5 years of Federal service and subsequently leave the service will have available, as a deferred annuity, a monthly income representing their own contributions plus the Government's retirement obligation for the period of service rendered. This provision, however, does not adequately compensate workers whose active old-age and survivors insurance participation terminates upon their entering Federal service. Individuals with wives, children, and dependent parents will lose the protection afforded their survivors in the event of their death, and all who return to private pursuits will be obliged to make up the "Federal gap" before they regain insured status. Moreover, a permanent reduction will have been made in their average wage for benefit purposes. A small potential annuity from the civil-service retirement system cannot make up for lapse in protection of survivors, should the individual die, which may represent the loss of thousands of dollars of insurance value. Even this deferred annuity does not apply if the employee has had less than 5 years' service on terminating his Federal service; in that case he receives a refund of his contributions plus interest, or contributions minus $1 a month (tontine)[6] plus interest, depending on whether his separation is voluntary or involuntary.

Since at present, for large numbers of these duration employees, the long-range protection of the old-age and survivors insurance program is impaired by their civilian war service, it is pertinent to examine the steps which could be taken to right this anomaly and remove or abate the impairment. By hypothesis, the more satisfactory and basic solution of complete coverage of Government employees under old-age and survivors insurance has been ruled out of this discussion.

It has been suggested that whatever solution in respect to old-age and survivors insurance is worked out for the armed forces should apply in this civilian area also. Since no one plan for servicemen is yet advocated with much unanimity, however, this suggestion offers no concrete solution of the civilian problem, which seems more immediate than that affecting the armed forces. The complete moratorium would give no substitute death-benefit protection comparable to veterans' benefits. The incomplete moratorium of paying benefits but collecting no taxes and chalking up neither zero wages nor time elapsed would clearly deprive the old-age and survivors insurance trust fund of any quid pro quo, and

[5] *The Washington Post*, May 28, 1942.

[6] A charge of $1 per month deducted from the employee's contributions and credited to the general retirement and disability fund.

Table 1.—*Growth in selected defense and war agencies, January 1940–April 1942*

Agency	Number of employees		Increase	
	January 1940	April 1942	Number	Percent
Total, executive branch	936,700	2,011,800	1,075,100	115
Total, 10 agencies	298,500	1,306,800	1,008,300	338
War Department	120,600	724,800	604,200	501
Navy Department	101,000	401,000	300,000	297
Civil Aeronautics Administration	5,200	7,700	2,500	48
Civil Service Commission	1,800	6,400	4,600	256
Maritime Commission	1,600	4,400	2,800	175
Office for Emergency Management		21,900	21,900	
Panama Canal	16,000	36,600	20,600	129
Selective Service System		21,400	21,400	
Tennessee Valley Authority	13,500	38,800	25,300	187
Veterans Administration	38,800	43,800	5,000	13

Source: Civil Service Commission, Statistical Division, *Monthly Report of Employment . . .* June 12, 1942.

would also involve various administrative difficulties, particularly with respect to those who may have intermittent or part-time covered employment. Unless the old-age and survivors insurance trust fund is prepared to grant an indefinite "free ride" as to tax collections, any moratorium or freezing plan for civilians does not seem susceptible of satisfactory development.

It seems probable that the majority of these duration employees will leave the Federal civilian ranks after the war, though perhaps not immediately. Would it then not be feasible to consider all employees entering after a given date as a special group for purposes of continuing old-age and survivors insurance protection of those with previous covered employment and including in the system those who may have their first jobs in Federal service but will spend the greater part of their working life in employment covered by the old-age and survivors insurance system. The President declared a limited emergency in September 1939, and the resulting increase in personnel began to be noticeable shortly thereafter; January 1, 1940, might therefore be chosen as the beginning date for defining such special group. Large numbers of employees hired after January 1, 1940, came through regular civil-service channels and received classified jobs in the civil-service system. This situation held until Executive Order No. 9063 of February 16, 1942, which provided that personnel appointed for most positions thereafter should not acquire classified civil-service status, though they were not excluded from the provisions of the civil-service retirement system. This order gives further support for establishing a special classification of employees, although its date is too late for effective use and January 1, 1940, is suggested.

Another delimitation of the special group should be that it is confined to the executive branch of the Government, where the large increase in personnel has taken and is taking place; this provision would exclude legislative and judicial employees and personnel of the District Government. However, to allow for possible war corporations, seized plants, and other establishments owned or controlled by the Government, the plan could permit the President by Executive Order to include employees of such owned, controlled, or seized establishments in the special group if he decides that such inclusion is warranted.

The special group should be confined, as far as practicable, to bona fide new Government employees. Thus, it might exclude any reentrant who, prior to January 1, 1940, had accumulated 3 years of Federal employment creditable under section 5 of the Civil Service Retirement Act. There might be other preferable administrative short cuts to this weeding-out process.

The special group should be confined to those in the Federal service on a set date (to be discussed later) together with those hired after that date, and there would be no retroactive treatment for persons who had been in Federal service but had left prior to the set date. The termination date for the special group should be fixed at a point after the end of the war—perhaps 6 months, to conform with the tenure established under Executive Order No. 9063. It may well be, however, that 6 months will be much too short, depending on the nature of the peace and the military, social, and economic problems it may impose on the Government.

Individuals should probably not be excluded from the group on the basis of temporariness or intermittency of their employment, as they are excluded from the civil-service retirement system by Executive Order No. 9154, although certain contractors, consultants, and dollar-a-year men could reasonably be omitted.

Additional criteria might be necessary or advisable for the complete delimitation of this special group. But assuming a satisfactory definition, what then is the treatment suggested? It is pro-

posed that the members of this special group be included in the old-age and survivors insurance coverage, commencing with an effective date (to be decided) and ending with a calendar date (to be decided) which will terminate the special group as such. As to the effective beginning date there are several possibilities. Assuming that in no event will Federal service prior to January 1, 1940, be counted, that date might be chosen as the starting date, and all persons hired thereafter (subject to the other conditions) would be included and credited with their Federal service from then on. This procedure would raise the question of back tax collections and necessitate tracing back, practically on an individual basis, to discover the period on the Federal pay roll and the salary paid since January 1, 1940, or later entrance date. Another method might be to assign an arbitrary but reasonable salary—say $150 a month—for use in computing the back taxes and wage credits; this method would still require tracing the periods of employment. Still another suggestion is to treat any interval of Federal service since January 1, 1940, and the effective date of extension as a moratorium period for tax obligations and credited wages, tying in the latter date to the date of induction after January 1, 1940, as if there were no gap—again an awkward matter of individual adjustment.

An approach which assumes that the gap is not yet wide enough to harm seriously the rights of the majority of duration-employees, and one which would obviate individual adjustments and enormously simplify administrative problems, is to allow any hiatus between January 1, 1940, and the effective date of the extension to remain as noncovered employment. Thus, if the extending amendment were effective October 1, 1942, a person who entered Federal service on October 1, 1940, would have a permanent 2-year gap in his old-age and survivors insurance records. Assuming that he came from covered employment and had had such employment since January 1, 1937, he would have acquired 3¾ years of coverage on October 1, 1940, and would still be fully insured on October 1, 1942. Picking up from October 1, 1942, he could maintain his insured status thereafter. The gap would, of course, operate to reduce somewhat his average wage, on which benefits are computed, but this reduction would become less with the passage of time. In other cases in which insured status has actually lapsed during the gap, a certain length of time would be required to regain it. This simplified plan of treating the gap would, however, be far more advantageous to the individual than the present ever-widening noncovered interval.

Having established the special group and having set the formula for treating the gap since January 1, 1940, the plan of extension would provide for regular tax collections from the included employees and the Government as employer from the effective date, say October 1, 1942, onward. Regular wage credits would be posted, and death or retirement claims would be handled under the regular adjudicative processes for old-age and survivors insurance benefits. At the termination of the special group, or earlier separation from Government service, such wage credits and insured status as an employee had built up while in Federal service would remain to his credit in the old-age and survivors insurance records.

In appraising this proposal it must be borne in mind that a majority of these duration employees are also required to contribute to the civil-service retirement system, under which the rate of deduction increased from 3½ to 5 percent as of July 1, 1942. The old-age and survivors insurance tax proposed herein would be in addition to the civil-service deduction. Hence, if the plan commenced October 1, 1942, there would be 3 months in which the total deduction would be 6 percent, and after January 1, 1943, for 3 years (on present statutory tax scale and if the special group exists) the total rate would be 7 percent. (Total rates apply to the first $3,000 only; above that amount only the civil-service rate of 5 percent applies.) This deduction load does not appear unreasonable in these days of high taxes and savings, particularly in view of the fact that the money would go into Government securities in the two trust funds. The contribution to civil service is solely a savings plan for all those duration employees who leave Government service within 5 years; and for those who do not leave for some time after having acquired 5 years of service, the contributions help provide a vested deferred annuity to commence at age 62, the size of which depends on the length of Government service and the mode of separation therefrom. It is recognized also that some workers who do not continue in covered employment would lose the benefit rights they might acquire under old-age

and survivors insurance during their Federal employment; their situation, however, would be no different from that of persons who work for only a brief period in private covered employment and subsequently, after leaving it, lose rights they have thus acquired. For any but a temporary plan, a method of coordination between such deferred annuity and the old-age and survivors insurance retirement benefits would be necessary (see the article in the May 1940 Bulletin); on a relatively short-term basis, however, the problems of anomalies and duplicate retirement benefits should not be important.

Assuming for purposes of this article that it is not yet feasible to adopt the most satisfactory and basic solution of complete coverage of Government employees under old-age and survivors insurance, and adopting among the alternate specifications discussed above the ones which appeal to the writer, the proposal outlined is, in summary: to provide that all civilian employees (1) who are on the active pay roll of the executive branch on or after October 1, 1942 (or other date) and (2) who have been inducted into Government service since January 1, 1940 (without having had 3 previous years of Federal service) shall be covered from October 1, 1942, under the benefit and contribution provisions of the Social Security Act; this coverage and participation shall continue until a date to be fixed as 1 year (or other period) beyond the official ending of the states of war; during this period and thereafter all provisions with respect to old-age and survivors insurance wage credits, insured status, and benefits shall operate to make such period and such employment a permanent part of the included coverage for old-age and survivors insurance; the plan shall not change any schedules for deductions, contributions, or benefits under any Federal retirement or benefit system in which any such employee is also participating.

This, then, is a general sketch of a plan for alleviating the losses of protection and impairments of old-age and survivors insurance wage credits among civilian Government employees, which are now operating and will continue to operate if no corrective amendments to title II of the Social Security Act are adopted. As stated earlier, the armed forces appear to have adequate substitute protections, and the problem for them will come mainly at the end of the war, although the railroad retirement system already has legislation[7] protecting the "military gap" as to railroad workers entering the armed forces. Also, unemployment insurance legislation in the States is being amended to recognize the serviceman's possible future job problem. For civilian Government employees, little if any special treatment as to unemployment insurance has been accorded or discussed; the civil-service retirement refund upon separation, plus the Federal annual-leave provisions, may represent for the duration employees a fair substitute for the unemployment compensation benefit, the rights to which they can later regain in private fields. The writer feels that an immediate need is in the area of Federal civilian personnel, the so-called duration employees.

In Great Britain the basic social security program has been recognized as primary for temporary civilian Government workers, and such employees have not been brought within the civil-service staff pension plan. They have been continued under the social insurances, the peacetime areas of which they came from and to which they expect to return. Our approach to the matter thus far appears to be along opposite lines, which need at least partial correction if impairment of old-age and survivors wage credits and loss of insurance protection are to be obviated.

[7] Public, No. 520, 77th Cong.

PUBLIC ASSISTANCE

BUREAU OF PUBLIC ASSISTANCE

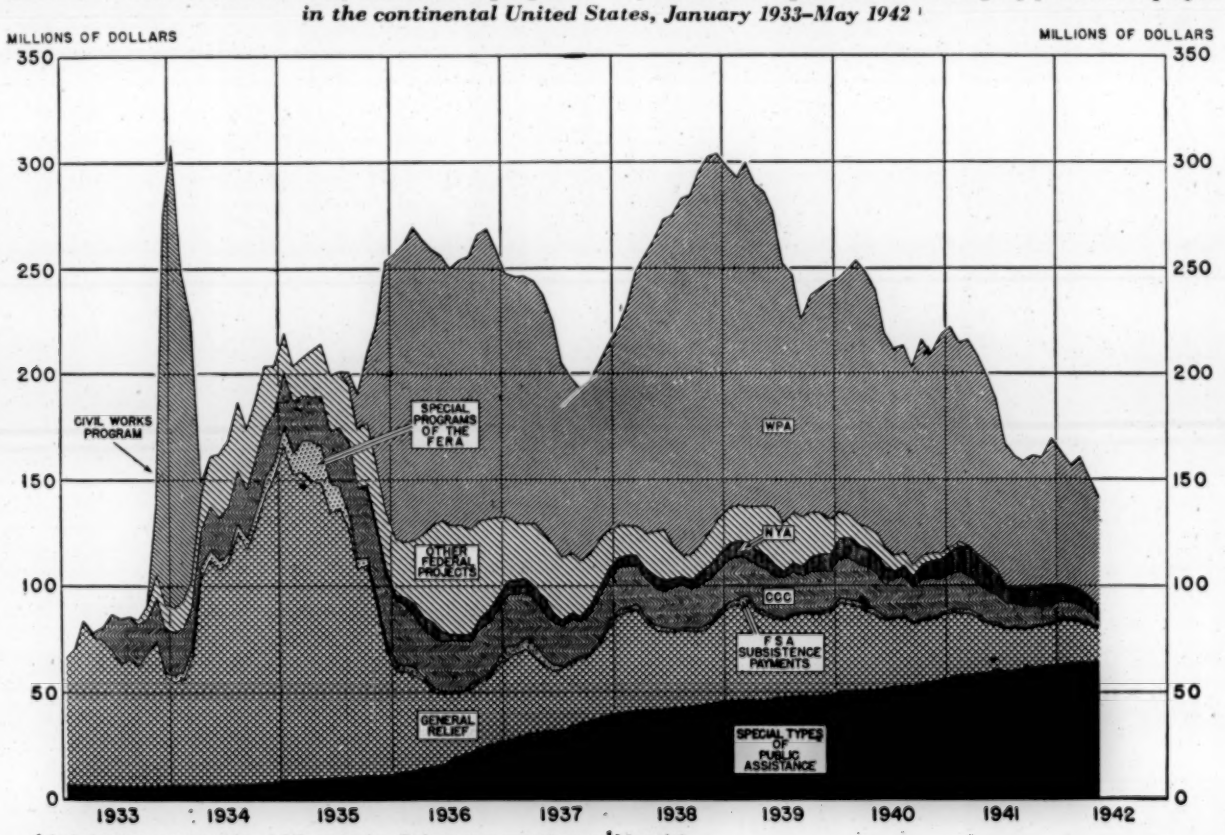
Public assistance and earnings under the Federal work programs in the continental United States in May amounted to an estimated $141.6 million, a decrease of 5.8 percent from April 1942 and 28.8 percent from May 1941, and represented the lowest amount expended since November 1933. The estimates of 8.9 million persons in 3.7 million households benefiting from these payments were the lowest since complete records were available in January 1933.

April–May changes of 1 percent or less occurred in all three of the special types of public assistance; old-age assistance and aid to the blind increased and aid to dependent children decreased in both recipients and payments. The other assistance and Federal work programs decreased. General relief cases declined 9.1 percent and payments 10 percent. Persons employed by the Federal work programs and their earnings dropped 10 percent.

The special types of public assistance accounted for 45 percent of estimated total expenditures for the month, exceeding the total for the Federal work programs for the first time since April 1933. The Federal work programs accounted for 43 percent and general relief for 11 percent.

In States with plans approved by the Social Security Board in both years, the number of persons receiving old-age assistance in May 1942 was larger in 35 States than in May 1941; the number receiving aid to the blind, in 26 States; and the number of families receiving aid to dependent children, in 18 States. In contrast, each State reported a smaller number of cases receiving general relief.

Chart 1.—*Public assistance and Federal work programs: Payments to recipients and earnings of persons employed in the continental United States, January 1933–May 1942* [1]



[1] Includes estimate for FSA, CCC, and other Federal agency projects for May 1942.

471924—42——3

Table 1.—*Public assistance and Federal work programs: Assistance and earnings in the continental United States, by month, May 1941–May 1942*

[In thousands]

Year and month	Total	Assistance to recipients					Earnings of persons employed under Federal work programs					Earnings on regular Federal construction projects [2]
		Special types of public assistance			General relief	Subsistence payments certified by the Farm Security Administration [3]	Civilian Conservation Corps	National Youth Administration [4]		Work Projects Administration [5]	Other Federal agency projects financed from emergency funds [6]	
		Old-age assistance	Aid to dependent children	Aid to the blind				Student work program	Out-of-school work program			
1941												
May	$198,988	$44,118	$12,858	$1,896	$23,280	$975	$14,765	$3,385	$8,129	$88,246	$1,336	$106,415
June	188,052	45,686	12,808	1,896	20,581	1,670	12,902	2,895	7,992	80,754	1,173	110,103
July	167,063	45,333	12,570	1,889	19,828	308	11,693	26	7,164	67,332	920	119,282
August	161,139	45,693	12,573	1,905	19,643	442	11,430	1	7,507	61,156	787	129,808
September	158,650	46,188	12,562	1,910	18,546	318	10,665	180	7,384	60,285	642	137,119
October	161,400	46,860	12,698	1,949	18,591	372	9,616	1,731	7,115	61,974	494	156,661
November	160,393	47,226	12,841	1,969	18,438	509	9,572	2,364	7,419	59,732	323	167,074
December	169,835	47,506	13,111	1,993	19,474	748	8,448	2,290	6,849	68,936	480	166,800
1942												
January	162,134	47,925	13,310	2,029	20,163	1,404	7,686	1,842	5,747	61,775	233	166,029
February	157,465	48,512	13,553	2,017	19,225	1,663	7,135	1,675	5,656	57,794	235	186,106
March	159,453	48,278	13,639	2,029	18,818	1,383	6,332	1,670	5,407	61,781	121	194,221
April	150,322	48,453	13,591	2,038	17,182	907	5,071	1,637	5,101	56,283	59	236,843
May	[1] 141,600	48,899	13,451	2,040	15,395	[10]	4,262	1,555	4,787	50,488	35	287,005

[1] Partly estimated and subject to revision. For 1933 data, see the Bulletin, February 1941, p. 66; for January 1934–April 1941, see the Bulletin, February 1942, pp. 26–27. For definitions of terms, see the Bulletin, September 1941, pp. 50–52.

[2] Excludes earnings on regular Federal construction projects.

[3] Data from the FSA.

[4] Data from the CCC. Beginning July 1941, earnings of persons enrolled estimated by the CCC by multiplying average monthly number of persons enrolled by average of $67.20 for each month for enrollees other than Indians and $60.50 for Indians.

[5] Data from the NYA.

[6] Data from the WPA.

[7] Data from the Bureau of Labor Statistics. Beginning with October 1941, represents earnings on projects financed from PWA funds only; data not available for other Federal agency projects financed under Emergency Relief Appropriation acts, but latest available reports showed total monthly earnings of approximately $100,000.

[8] Excluded from total; data from the Bureau of Labor Statistics.

[9] Partly estimated.

[10] Data not available

Table 2.—*Public assistance and Federal work programs: Recipients of assistance and persons employed in the continental United States, by month, May 1941–May 1942* [1]

[In thousands]

Year and month	Estimated unduplicated total [2]		Recipients of assistance						Persons employed under Federal work programs					Persons employed on regular Federal construction projects [3]
			Special types of public assistance				Cases receiving general relief	Cases for which subsistence payments were certified by the Farm Security Administration [3]	Civilian Conservation Corps [4]	National Youth Administration [5]		Work Projects Administration [6]	Other Federal agency projects financed from emergency funds [7]	
	Households	Persons in these households	Old-age assistance	Aid to dependent children		Aid to the blind				Student work program	Out-of-school work program			
				Families	Children									
1941														
May	4,913	13,048	2,148	393	944	74	1,038	36	228	462	392	1,453	10	723
June	4,691	12,375	2,167	391	942	74	934	40	195	357	384	1,376	9	718
July	4,145	10,811	2,181	388	935	74	876	14	176	6	318	1,028	7	758
August	4,040	10,412	2,195	386	931	74	859	18	171	(8)	315	1,015	6	783
September	4,000	10,231	2,205	384	926	75	817	11	159	34	308	1,007	5	835
October	4,094	10,272	2,214	385	928	76	796	13	144	278	288	1,009	4	928
November	4,136	10,326	2,224	386	928	77	782	16	143	341	303	1,027	2	991
December	4,125	10,331	2,234	390	941	77	798	26	126	333	283	1,023	2	977
1942														
January	4,147	10,413	2,240	396	953	78	836	42	115	306	234	995	2	965
February	4,107	10,335	2,241	399	960	78	817	46	107	256	231	998	2	1,038
March	4,029	10,053	2,245	401	966	78	784	38	95	247	220	933	1	1,145
April	3,826	9,340	2,245	401	963	78	723	24	76	237	205	857	(9)	1,332
May	[10] 3,676	[10] 8,884	2,248	399	958	78	657	(11)	64	215	181	759	(9)	1,609

[1] Partly estimated and subject to revision. For 1933 data, see the Bulletin, February 1941, p. 68; for January 1934–April 1941, see the Bulletin, February 1942, pp. 28–29. For definitions of terms, see the Bulletin, September 1941, pp. 50–52.

[2] Estimated by the Work Projects Administration and the Social Security Board. Excludes persons employed on regular Federal construction projects.

[3] Data from the FSA.

[4] Data from the CCC.

[5] Data from the NYA. Beginning July 1941, number employed on out-of-school work program based on an average of weekly employment counts during month.

[6] Data from the WPA.

[7] Data from the Bureau of Labor Statistics. Beginning with October 1941, represents employment on projects financed from PWA funds only; data not available for other Federal agency projects financed under Emergency Relief Appropriation acts, but latest available reports showed total monthly employment of approximately 1,000.

[8] Excluded from estimated unduplicated total; data from the Bureau of Labor Statistics.

[9] Less than 500 persons.

[10] Preliminary.

[11] Data not available.

Table 3.—*Special types of public assistance: Recipients and payments to recipients in States with plans approved by the Social Security Board, by month, May 1941–May 1942* [1]

Year and month	Number of recipients				Amount of payments to recipients			
	Old-age assistance	Aid to dependent children		Aid to the blind	Total	Old-age assistance	Aid to dependent children	Aid to the blind
		Families	Children					
1941								
May	2,151,518	380,831	918,895	49,700	$57,944,086	$44,186,359	$12,582,640	$1,175,087
June	2,170,489	379,605	916,789	49,817	59,466,477	45,754,779	12,532,362	1,179,336
July	2,184,792	376,148	909,567	49,878	58,871,288	45,403,047	12,297,714	1,170,527
August	2,198,037	374,403	905,543	50,208	59,243,460	45,761,626	12,297,580	1,184,254
September	2,208,098	372,288	900,968	50,412	59,743,651	46,256,821	12,293,201	1,193,629
October	2,217,273	380,830	919,541	51,791	60,764,272	46,928,895	12,604,077	1,231,300
November	2,227,333	381,163	919,892	52,187	61,300,389	47,295,058	12,758,341	1,246,990
December	2,237,386	387,159	934,980	52,616	61,907,635	47,878,672	13,068,605	1,263,358
1942								
January	2,243,158	393,109	947,970	53,094	62,544,104	47,994,615	13,271,190	1,278,299
February	2,244,515	396,417	954,863	53,454	63,386,702	48,582,792	13,511,395	1,292,515
March	2,248,444	398,533	959,192	53,704	63,242,686	48,343,626	13,597,643	1,301,417
April	2,248,421	397,724	956,928	53,914	63,382,340	48,522,800	13,549,280	1,310,260
May	2,250,988	395,742	952,038	54,129	63,687,872	48,909,046	13,405,449	1,313,377

[1] For definitions of terms, see the Bulletin, September 1941, pp. 50–52.

Chart 2.—*Special types of public assistance and general relief: Index of payments to recipients in the continental United States, January 1933–May 1942*

[Average month 1936=100]

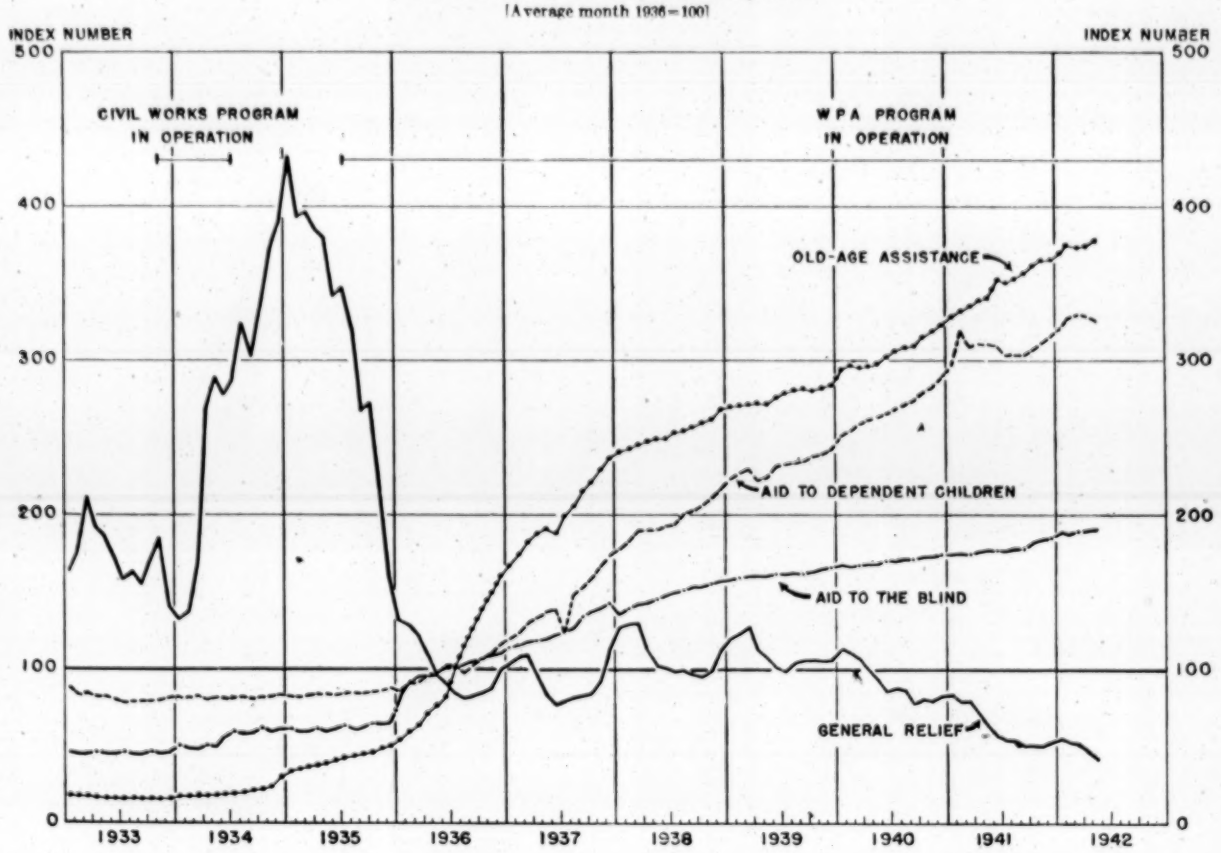


Table 4.—*Food stamp plan: Number of areas included and participants, and value of stamps issued in the continental United States, by month, May 1941–May 1942* [1]

Year and month	Number of areas included [2]	Number of participants [3]		Value of food stamps issued
		Cases	Persons	
1941				
May	346	1,230,000	3,968,900	$9,902,603
June	363	1,213,111	3,925,000	9,950,959
July	374	1,184,490	3,821,600	9,998,088
August	388	1,152,431	3,706,800	9,782,709
September	389	1,122,628	3,598,200	9,645,306
October	390	1,083,306	3,447,700	9,078,800
November	390	1,061,094	3,331,300	8,803,766
December	398	1,044,201	3,459,400	9,395,102
1942				
January	399	1,095,636	3,528,100	9,428,392
February	1,307	1,115,946	3,589,600	9,605,399
March	1,388	1,092,103	3,584,000	9,783,140
April	1,458	1,043,931	3,322,700	9,246,138
May [4]	1,481	986,175	3,094,800	8,718,110

[1] Data exclude persons receiving commodities under direct distribution program of the Agricultural Marketing Administration and value of such commodities.

[2] Through January 1942, an area represents a city, county, or group of counties; beginning with February 1942, an area represents a county or city.

[3] Includes recipients of 3 special types of public assistance and of subsistence payments from the FSA; recipients of, and those eligible for, general relief; persons certified as in need of relief and employed on or awaiting assignments to projects financed by the WPA. Includes for 1 area (Shawnee, Okla.) some low-income families having weekly income of less than $19.50 who have been eligible to participate since October 1939.

[4] Preliminary.

Source: U. S. Department of Agriculture, Agricultural Marketing Administration.

Chart 3.—*Special types of public assistance and general relief: Payments to recipients in the continental United States, January 1936–May 1942*

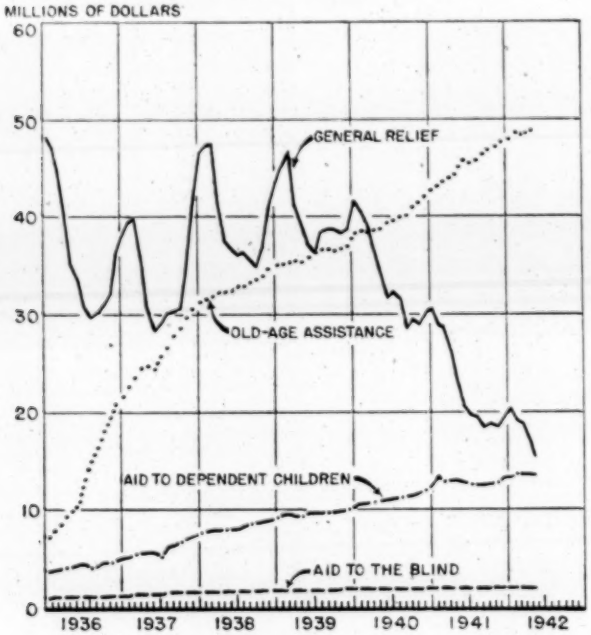


Table 5.—*General relief: Cases and payments to cases in the continental United States, by State, May 1942* [1]

State	Number of cases receiving relief	Amount of payments to cases	Average payment per case	Percentage change from—			
				April 1942 in—		May 1941 in—	
				Number of cases	Amount of payments	Number of cases	Amount of payments
Total [2]	657,000	$15,395,000	$23.43	−9.1	−10.4	−36.7	−33.9
Ala.	2,292	20,791	9.07	(3)	+.9	−5.6	−4.1
Ariz.	2,705	53,510	19.78	−2.4	−.7	−12.0	+8.8
Ark.	3,835	24,284	6.33	+.6	−3.9	−11.2	−3.4
Calif.	27,262	656,472	24.08	−7.1	−4.1	−62.1	−66.6
Colo. [4]	9,006	167,197	18.56	−12.8	−11.1	−28.1	−.9
Conn.	5,663	164,515	29.05	−9.1	−7.9	−41.5	−35.2
Del.	560	10,942	19.54	−4.8	−7.9	−47.8	−47.5
D. C.	1,702	43,103	25.32	−7.7	−7.0	−20.8	−18.9
Fla.	6,911	49,584	7.17	−4.0	−1.7	−18.1	−19.2
Ga.	5,317	39,261	7.38	−1.6	+1.1	−10.8	+2.3
Idaho [5]	1,107	16,695	15.08	−6.6	−7.5	−24.0	−19.4
Ill.	82,999	2,035,448	24.52	−8.5	−7.8	−34.4	−24.4
Ind. [4]	18,428	261,119	14.17	−15.3	−21.5	−33.7	−30.7
Iowa	13,925	214,126	15.38	−15.1	−16.9	−33.3	−32.4
Kans.	9,167	163,210	17.80	−8.3	−9.2	−30.9	−19.3
Ky.	[6] 3,500	[6] 37,000					
La.	11,757	191,813	16.31	−.3	−.3	−6.5	−6.2
Maine	4,600	105,813	23.00	−10.4	−14.5	−41.0	−32.2
Md.	6,389	134,595	21.07	−5.4	−6.6	−16.8	−13.8
Mass.	29,198	731,848	25.07	−7.9	−12.9	−28.6	−27.4
Mich.	28,718	642,004	22.36	−13.2	−18.7	−28.9	−17.4
Minn.	17,268	350,305	20.29	−15.5	−20.2	−36.0	−36.7
Miss.	596	2,734	4.59	+1.5	+.4	−35.1	−14.0
Mo.	14,026	203,486	14.51	−7.2	−10.1	−34.5	−26.1
Mont.	2,227	36,391	16.34	−16.2	−15.4	−32.8	−26.6
Nebr.	4,851	57,108	11.77	−13.3	−16.1	−28.4	−21.4
Nev.	469	7,046	15.02	+8.8	+9.3	−1.7	−6.1
N. H.	[6] 3,100	[6] 74,000					
N. J. [4]	18,077	419,815	23.22	−8.8	−11.8	−42.8	−39.0
N. Mex. [7]	1,261	11,290	8.95	−.9	−2.5	−29.7	−17.9
N. Y.	[8] 152,740	5,896,225	36.64	−5.4	−7.7	−28.2	−26.2
N. C.	3,878	27,741	7.15	−8.1	−6.0	−15.7	−14.1
N. Dak.	2,101	31,282	14.89	−22.5	−24.0	−26.6	−16.8
Ohio	34,693	650,802	19.02	−10.9	−14.7	−37.5	−28.5
Okla.	[9] 7,905	40,305	(9)	(9)	−1.1	(9)	+7.4
Oreg.	4,393	92,147	20.98	−10.5	−7.2	−39.2	−22.1
Pa.	54,158	1,090,424	20.13	−13.0	−12.1	−59.8	−63.2
R. I. [10]	4,122	139,991	33.96	−12.9	−13.6	(11)	−22.3
S. C.	2,161	18,583	8.60	−4.6	−2.7	−1.1	+3.8
S. Dak.	2,894	42,549	14.70	−20.0	−19.8	−27.8	−15.0
Tenn.	[6] 2,200	[6] 14,000					
Tex.	7,799	71,040	9.11	−7.6	−7.9	−24.7	−16.4
Utah	3,038	81,279	26.75	−12.4	−13.7	−42.3	−45.8
Vt.	1,232	23,484	19.06	−13.4	−8.1	−32.6	−24.9
Va.	4,730	49,502	10.47	−4.8	−6.8	−16.3	−9.4
Wash.	6,479	140,768	21.73	−6.0	−10.2	−37.6	−17.0
W. Va.	12,736	137,389	10.79	−11.4	−13.5	−15.3	+8.5
Wis.	17,728	369,237	20.83	−12.0	−19.7	−37.7	−30.9
Wyo.	846	14,702	17.38	−15.5	−17.7	−23.3	−11.5

[1] For definitions of terms, see the Bulletin, September 1941, pp. 50–52.

[2] Partly estimated; does not represent sum of State figures, because an estimated number of cases receiving medical care, hospitalization, and/or burial only and total payments for these services in 3 States have been excluded, and data on cases aided in Oklahoma have been estimated to exclude duplication.

[3] No change.

[4] Includes unknown number of cases receiving medical care, hospitalization, and/or burial only, and total payments for these services.

[5] Excludes assistance in kind and cases receiving assistance in kind only and, for a few counties, cash payments and cases receiving cash payments. Amount of payments shown represents approximately 70 percent of total expenditures.

[6] Estimated.

[7] State program only; excludes program administered by local officials.

[8] Includes cases receiving medical care only; number believed by State agency to be insignificant.

[9] Represents 3,595 cases aided under program administered by State board of public welfare, and 4,310 cases aided by county commissioners; amount of duplication believed to be large; average per case and percentage change in number of cases cannot be computed.

[10] Partly estimated.

[11] Comparable data not available.

Table 6.—*Old-age assistance: Recipients and payments to recipients, by State, May 1942* [1]

State	Number of recipients	Amount of payments to recipients	Average payment per recipient	Percentage change from—			
				April 1942 in—		May 1941 in—	
				Number of recipients	Amount of payments	Number of recipients	Amount of payments
Total [2]	2,250,988	$48,969,046	$21.75	+0.1	+0.9	+4.6	+10.8
Ala	21,182	202,331	9.55	+.4	+2.6	+5.6	+10.5
Alaska	1,571	46,344	29.50	−.2	+.3	−.1	+3.4
Ariz	9,472	325,868	34.40	+.5	+.5	+7.6	+31.8
Ark	25,025	208,250	8.32	+.1	(3)	−3.9	+3.8
Calif	158,032	5,763,133	36.47	−.2	−.2	+1.6	−1.9
Colo	[4] 42,918	[4] 1,371,745	31.96	(5)	+3.3	+1.2	+8.6
Conn	17,660	518,010	29.33	−.4	−.1	+.2	+3.3
Del	2,356	80,111	12.78	−.3	+.2	−5.6	+4.8
D.C	3,538	93,210	26.35	−1.7	−1.7	+1.0	+3.5
Fla	42,576	605,356	14.22	+1.5	+1.7	+12.2	+22.5
Ga	64,593	569,098	8.81	+2.0	+2.4	+27.6	+35.4
Hawaii	1,734	24,071	13.88	−.5	(3)	−4.3	+3.9
Idaho	9,872	231,217	23.42	+.6	+1.2	+6.6	+10.1
Ill	150,403	3,936,911	26.18	+.1	+1.0	+3.1	+17.5
Ind	70,466	1,378,805	19.57	(3)	+2.1	+4.9	+11.1
Iowa	56,586	1,208,742	21.36	−.2	+.1	−.4	+2.0
Kans	31,140	693,868	22.28	+.3	−3.5	+8.8	+25.2
Ky	57,558	559,994	9.73	−1.0	+.3	+2.0	+11.1
La	35,592	474,976	13.35	+.1	+.3	−1.4	−1.4
Maine	15,767	334,348	21.21	+1.9	+2.0	+25.2	+27.5
Md	16,754	316,872	18.91	−.7	−.5	−7.0	−1.5
Mass	86,865	2,844,400	32.75	−.3	+8.9	−.4	+12.7
Mich	92,821	1,793,610	19.32	−.2	+2.2	+8.5	+22.9
Minn	63,340	1,409,946	22.26	−.1	+.1	+.6	+5.0
Miss	27,057	244,080	9.02	−.8	−.8	+2.5	+5.9
Mo	115,778	1,540,973	13.31	−.5	−.2	+2.6	−23.7
Mont	12,502	280,132	22.41	+.1	+2.2	+.4	+11.4
Nebr	29,558	549,889	18.60	−.3	+1.2	+2.3	+11.7
Nev	2,230	68,188	30.58	−.6	−.1	−4.0	+10.5
N. H	7,304	166,438	22.79	+.1	+.6	+5.7	+11.4
N. J	30,065	677,916	22.55	−.7	−.5	−3.6	+2.2
N. Mex	5,102	82,671	16.20	−.2	−.2	+5.9	−1.0
N. Y	119,760	3,123,902	26.08	−.8	−2.5	−1.3	+4.3
N. C	39,222	404,767	10.32	(3)	+.1	+4.8	+6.3
N. Dak	9,515	175,595	18.45	−.2	+.3	+4.0	+11.1
Ohio	139,357	3,337,834	23.95	(3)	+.4	+1.5	+4.5
Okla	77,770	1,499,231	19.28	+.2	+.6	+2.0	+9.4
Oreg	21,848	502,700	23.01	+.2	+1.3	+5.9	+13.8
Pa	98,387	2,254,811	22.92	−1.1	−.7	−4.9	−2.1
R. I	7,423	172,912	23.29	−.2	+1.0	+6.9	+22.9
S. C	20,913	237,153	11.34	+2.1	+5.9	+20.6	+77.3
S. Dak	14,838	284,324	19.16	−.1	+.1	−.9	−1.0
Tenn	37,548	434,559	11.57	+4.8	+7.4	−6.6	+6.6
Tex	171,536	3,358,779	19.58	+1.5	+2.1	+29.2	+120.6
Utah	14,610	394,632	27.01	−.4	−.3	+2.9	+4.4
Vt	5,567	98,081	17.62	+.8	+1.6	−4.5	(3)
Va	19,905	205,077	10.30	−.5	−.4	−.4	+2.6
Wash	64,389	2,156,738	33.50	+.1	+.4	+14.0	+18.3
W. Va	23,276	409,532	17.59	+.5	+.9	+22.1	+46.6
Wis	54,139	1,278,015	23.61	−.2	−.2	+.4	+4.1
Wyo	3,568	88,901	24.92	−.3	(3)	+1.4	+5.2

[1] For definitions of terms, see the Bulletin, September 1941, pp. 50–52.
[2] All 51 States have plans approved by the Social Security Board.
[3] Decrease of less than 0.05 percent.
[4] Includes $106,788 incurred for payments to 3,332 recipients 60 but under 65 years of age.
[5] Increase of less than 0.05 percent.

Table 7.—*Aid to the blind: Recipients and payments to recipients, by State, May 1942* [1]

State	Number of recipients	Amount of payments to recipients	Average payment per recipient	Percentage change from—			
				April 1942 in—		May 1941 in—	
				Number of recipients	Amount of payments	Number of recipients	Amount of payments
Total	78,485	$2,040,874	$26.00	+0.2	+0.1	+6.1	+7.6
Total, 44 States [2]	54,129	1,313,377	24.26	+.4	+.2	+8.9	+11.8
Ala	654	6,253	9.56	+.9	+2.9	+5.8	+12.0
Ariz	408	13,666	33.50	+1.2	+1.7	+2.0	+24.4
Ark	1,166	11,325	9.71	−.2	+.1	+2.4	+8.7
Calif. [3]	7,202	337,221	46.82	−.5	−.6	−1.2	−3.9
Colo	639	21,191	33.16	−.2	+.2	+6.3	+14.6
Conn. [3]	214	6,008	28.07	+2.4	−.5	−.9	−1.3
D. C	286	9,574	33.48	+3.6	+9.9	+23.8	+36.0
Fla. [3]	2,734	41,319	15.11	+.1	+.6	+7.2	+17.1
Ga	1,988	22,871	11.50	+1.8	+2.4	+28.0	+36.4
Hawaii	78	1,272	16.31	(4)	(4)	(4)	(4)
Idaho	275	6,632	24.12	−.7	+.5	−1.1	+6.4
Ill	*7,415*	*223,707*	*30.17*	*−1.3*	*−1.0*	*−.8*	*−1.6*
Ind	2,363	51,443	21.77	+.2	+.8	−.4	+4.4
Iowa	1,539	41,608	27.04	+.1	+.9	+1.4	+13.9
Kans	1,344	31,519	23.45	(5)	−3.8	−4.7	+7.6
La	1,325	22,695	17.13	+1.0	+1.0	+7.5	+7.8
Maine	1,081	24,597	22.75	(5)	(6)	+1.0	+.9
Md	625	13,987	22.38	−.8	−.7	−7.8	−3.8
Mass	1,124	27,447	24.42	−.4	−.1	−4.4	−1.5
Mich	1,392	36,075	25.92	(5)	+.9	+14.0	+23.6
Minn	1,021	27,930	27.36	+.4	+.8	+4.2	+6.8
Miss	1,365	14,527	10.64	+1.5	+1.9	+32.5	+64.7
Mo	*75,000*	[7] *88,100*					
Mont	330	8,026	24.32	+2.8	+4.3	+32.0	+46.8
Nebr. [3]	729	15,702	21.54	−.8	+.2	+2.0	+6.1
Nev	*28*	*960*	*34.29*	(4)	(4)	(4)	(4)
N. H	334	7,999	23.95	+.9	+1.2	+1.8	+6.9
N. J	726	17,733	24.43	−.7	−.1	−3.3	−.5
N. Mex	234	4,325	18.48	+1.3	+1.0	+7.3	+5.8
N. Y	2,757	75,172	27.27	−.9	−2.9	−3.3	+3.1
N. C	2,232	33,886	15.18	−.2	+.2	+17.4	+18.9
N. Dak	137	3,049	22.26	−.7	−.3	−40.4	−36.9
Ohio	3,937	81,682	20.75	−.1	+.3	−2.1	+.5
Okla	2,190	49,415	22.56	(5)	+1.3	+1.8	+43.0
Oreg	467	12,850	27.52	−.2	+.2	+1.7	+12.1
Pa	*13,915*	*414,730*	*29.81*	*+.1*	*+.2*	*+2.4*	*+1.7*
R. I	95	2,163	22.77	(4)	(4)	(4)	(4)
S. C	816	8,845	10.84	+1.4	+1.4	+4.1	+10.8
S. Dak	252	3,862	15.33	+.8	+1.5	−9.7	−18.1
Tenn	1,577	19,656	12.46	+.9	−1.3	−3.7	+7.0
Tex	2,989	68,415	22.89	+6.4	+6.2	(5)	(5)
Utah	175	4,854	27.74	+.6	+.3	−3.8	+2.2
Vt	163	3,652	22.40	+.6	+.9	+3.2	+8.0
Va	1,082	14,068	13.00	(5)	+.3	+4.6	+8.3
Wash	1,007	35,981	35.73	−1.0	−.8	−3.5	+1.4
W. Va	1,020	22,767	22.32	+.3	+.4	+20.0	+45.8
Wis	1,919	46,223	24.09	−.8	−.5	−3.4	−1.6
Wyo	138	3,892	28.20	+1.5	+.8	−8.0	−4.6

[1] For definitions of terms, see the Bulletin, September 1941, pp. 50–52. Figures in italics represent programs administered under State laws from State and/or local funds without Federal participation. Delaware and Alaska do not have programs for aid to the blind, and information on status of program in Kentucky is not available.
[2] Total for States with plans approved by the Social Security Board.
[3] Includes program administered under State law without Federal participation.
[4] Not computed; less than 100 recipients.
[5] No change.
[6] Decrease of less than 0.05 percent.
[7] Estimated.
[8] Increase of less than 0.05 percent.
[9] No program for aid to the blind for May 1941.

Table 8.—*Aid to dependent children: Recipients and payments to recipients, by State, May 1942* [1]

State	Number of recipients		Amount of payments to recipients	Average payment per family	Percentage change from—					
					April 1942 in—			May 1941 in—		
					Number of recipients		Amount of payments	Number of recipients		Amount of payments
	Families	Children			Families	Children		Families	Children	
Total	399,569	961,024	$13,490,284	$33.76	−0.5	−0.5	−1.0	+1.5	+1.4	+4.5
Total, 47 States [2]	395,742	952,038	13,405,449	33.87	−.5	−.5	−1.1	+3.9	+3.6	+6.5
Alabama	5,555	15,909	84,436	15.20	−1.6	−1.2	+3.2	−4.8	−5.4	+5.1
Alaska	*[3] 90*	*[3] 210*	*[3] 5,200*							
Arizona	2,362	6,385	79,619	33.71	−.5	+1.0	−.4	−3.9	−2.0	−.8
Arkansas	6,298	16,306	90,607	14.39	−.7	−.4	−1.0	−2.9	−1.4	+2.9
California	14,001	33,336	724,952	51.78	−2.0	−2.0	−1.4	−11.6	−11.8	−4.3
Colorado	6,118	15,052	188,920	30.88	−.8	−1.1	−.9	−4.6	−4.1	−2.9
Connecticut	1,600	4,075	86,700	54.19	+4.8	+6.8	+13.5	[4] +23.4	[4] +37.2	[4] +49.2
Delaware	476	1,419	16,233	34.10	−5.6	−5.1	−3.1	−22.9	−17.6	−24.0
District of Columbia	1,130	3,308	41,355	36.60	−.6	+.4	−.4	+15.9	+11.6	+11.9
Florida [5]	5,820	13,768	138,749	23.84	+.5	+.4	+1.1	+34.5	+27.9	+45.2
Georgia	4,678	11,424	104,968	22.44	+.4	+.2	+.7	−2.6	−4.6	−.5
Hawaii	921	2,882	36,181	39.28	−3.8	−4.4	−1.7	−25.5	−28.0	−20.3
Idaho	3,053	7,797	98,336	32.21	−.9	−1.0	−.1	+.7	+2.6	+8.3
Illinois [5]	23,118	52,251	744,452	32.20	+.9	+1.1	+1.2	[4] +209.9	[4] +214.6	[4] +331.3
Indiana	15,182	31,527	464,088	30.57	−.8	−.8	−.3	−11.8	−10.9	−6.7
Iowa	*5,193*	*7,105*	*65,480*	*19.86*	*−1.0*	*−1.2*	*+5.9*	*−10.0*	*−10.8*	*−9.0*
Kansas	6,767	16,305	229,329	33.89	+1.4	+1.8	−2.0	+2.2	+4.2	+18.2
Kentucky	*[3] 430*	*[3] 1,420*	*[3] 15,400*							
Louisiana	15,116	38,473	404,026	26.73	−.8	−.7	−.9	−4.9	−2.9	−5.8
Maine	1,823	5,003	74,888	41.08	+.7	+.8	+1.4	+18.0	+28.7	+22.4
Maryland	5,594	15,518	180,779	32.32	−2.9	−2.9	−4.3	−16.2	−13.4	−11.0
Massachusetts	12,166	29,763	684,163	56.24	−1.3	−1.3	−3.5	−4.9	−5.8	−5.2
Michigan	21,052	48,686	913,797	43.41	−.9	−1.2	−.6	−1.7	−3.8	+5.4
Minnesota	9,130	21,840	317,803	34.81	−1.3	−.9	−1.7	−3.3	−2.5	−2.0
Mississippi	2,607	6,676	52,481	20.13	−.5	−.8	−.7	[6]	[6]	[6]
Missouri	14,192	32,550	332,507	23.43	−.2	[7]	+.1	+3.5	+2.4	−18.5
Montana	2,659	6,595	82,081	30.87	+.1	+.4	+.6	[7]	+2.1	+5.3
Nebraska [5]	5,517	12,333	156,541	28.37	−1.8	−2.0	−1.8	−5.4	−5.3	−2.4
Nevada	*114*	*251*	*2,815*	*24.69*	*+1.8*	*+10.6*	*+10.9*	[9]	−9.7	+.7
New Hampshire	831	2,084	38,904	46.89	+3.2	+2.6	+1.8	+42.5	+45.7	+45.6
New Jersey	8,646	19,713	275,573	31.87	−2.6	−2.5	−2.1	−20.5	−20.1	−19.7
New Mexico	2,379	6,968	66,196	27.83	+1.8	+1.8	+3.5	+16.2	+19.6	+22.9
New York	28,168	56,127	1,381,386	49.04	−2.8	−2.2	−3.8	−16.2	−15.1	−10.6
North Carolina	9,997	23,441	170,971	17.10	[7]	−.3	+.1	+.9	−1.3	+2.3
North Dakota	2,521	7,000	80,710	32.02	−.4	−.5	−.7	+.6	+1.4	+3.2
Ohio	11,606	30,478	436,459	37.61	−.7	−.4	−1.1	−1.4	−3.7	−6.2
Oklahoma	19,531	45,171	425,251	21.77	−.1	+.1	+1.9	+.1	+1.1	+46.2
Oregon	2,066	4,868	93,944	45.47	−1.0	−1.1	−.3	+1.3	+1.1	+12.6
Pennsylvania	50,265	126,220	2,036,243	40.51	−4.4	−4.5	−3.8	−21.6	−21.1	−13.9
Rhode Island	1,278	3,558	66,639	52.14	+1.7	+1.3	+3.0	−1.1	−3.4	+13.2
South Carolina	4,027	11,829	66,059	16.40	+.4	+.6	+1.2	+11.2	+10.6	−1.7
South Dakota	1,870	4,369	53,436	28.58	+1.4	+1.3	+1.4	+28.5	+28.2	+36.0
Tennessee	13,933	34,565	262,480	18.84	−.8	−.5	−2.7	−3.1	−4.1	−1.7
Texas	12,569	26,664	260,607	20.73	+30.9	+29.6	+30.5	[10]	[10]	[10]
Utah	3,712	9,767	163,479	44.04	−4.3	−3.8	−3.7	−7.0	−6.0	−2.1
Vermont	726	1,939	23,702	32.65	−.1	−.4	−.2	+18.4	+14.7	+18.7
Virginia	5,028	14,461	103,342	20.55	+.1	+.1	+.2	+17.2	+13.5	+19.6
Washington	5,024	12,150	210,676	41.93	−1.5	−1.8	−1.1	−4.4	−2.6	+11.4
West Virginia	12,389	32,897	383,955	30.99	+1.2	+1.4	+1.7	+34.2	+33.2	+70.8
Wisconsin	11,478	26,593	451,522	39.34	−2.0	−1.6	−3.9	−9.6	−7.8	−3.4
Wyoming	763	1,995	25,864	33.90	−.7	−.9	−.6	−.9	+2.0	+2.4

[1] For definitions of terms, see the Bulletin, September 1941, pp. 50–52. Figures in italics represent programs administered under State laws from State and/or local funds without Federal participation.

[2] Total for States with plans approved by the Social Security Board.

[3] Estimated.

[4] No approved plan for May 1941. Percentage change based on program administered under State law without Federal participation.

[5] Includes program administered under State law without Federal participation.

[6] May 1941 was third month of operation under approved plan. Percentage change not computed, since number of families aided and amount of payments made were negligible in that month.

[7] Decrease of less than 0.05 percent.

[8] In addition, in 62 counties payments amounting to $10,953 were made from local funds without State or Federal participation to 634 families in behalf of 1,561 children under the State mothers'-pension law; some of these families also received aid under plan approved by the Social Security Board.

[9] No change.

[10] No approved plan for May 1941. Percentage change not computed, since program administered under State law without Federal participation was not State-wide.

Table 9.—*Public assistance and Federal work programs: Assistance and earnings in the continental United States, by State, April 1942* [1]

[In thousands]

State	Total	Assistance to recipients					Earnings of persons employed under Federal work programs					Earnings on regular Federal construction projects
		Special types of public assistance [2]			General relief	Subsistence payments certified by the Farm Security Administration	Civilian Conservation Corps	National Youth Administration		Work Projects Administration	Other Federal agency projects financed from emergency funds	
		Old-age assistance	Aid to dependent children	Aid to the blind				Student work program	Out-of-school work program			
Total	$150,322	$48,453	$13,591	$2,038	[3] $17,182	$907	$5,071	$1,637	$5,101	$56,283	$59	$236,843
Alabama	1,917	197	82	6	21	49	208	37	149	1,169	----------	9,642
Arizona	885	324	80	13	54	25	121	7	18	243	----------	1,693
Arkansas	1,603	208	92	11	25	22	167	19	105	953	----------	3,449
California	10,712	5,776	735	339	[4] 685	79	116	98	136	2,748	----------	30,059
Colorado	2,539	1,328	191	21	188	13	45	18	54	676	5	439
Connecticut	1,093	519	76	6	179	----------	10	16	38	249	----------	2,884
Delaware	150	30	17	----------	12	[5]	2	2	10	76	1	609
District of Columbia	466	95	42	9	46	----------	15	10	16	234	----------	4,858
Florida	2,294	595	137	41	50	9	115	19	81	1,246	----------	2,971
Georgia	2,350	556	104	22	39	56	204	35	195	1,130	----------	3,796
Idaho	744	228	98	7	[6] 18	7	19	9	26	330	----------	297
Illinois	11,639	3,898	736	*226*	2,209	11	164	85	274	4,023	14	4,681
Indiana	3,665	1,350	465	51	[4] 333	9	55	41	105	1,255	[5]	4,249
Iowa	2,492	1,207	*61*	41	258	4	36	33	94	757	----------	829
Kansas	2,120	719	234	33	180	5	54	31	88	777	----------	1,420
Kentucky	2,427	558	[7] *15*	----------	[7] 44	31	298	28	151	1,301	----------	3,223
Louisiana	2,599	474	408	22	192	86	160	30	107	1,120	----------	4,405
Maine	809	328	74	25	124	4	15	9	67	163	----------	4,090
Maryland	1,062	318	189	14	144	4	28	18	45	302	----------	5,188
Massachusetts	6,954	2,613	709	27	840	1	54	60	152	2,498	----------	9,783
Michigan	6,133	1,754	919	36	790	22	135	56	188	2,232	----------	3,518
Minnesota	4,038	1,409	323	28	439	29	119	33	112	1,545	----------	2,392
Mississippi	1,573	246	53	14	3	51	188	23	93	903	----------	1,977
Missouri	4,609	1,544	332	[7] *88*	226	63	178	43	139	1,997	----------	8,790
Montana	945	274	82	8	43	14	45	12	24	444	----------	196
Nebraska	1,653	843	159	16	68	7	45	19	48	744	3	242
Nevada	141	68	*5*	*1*	6	[5]	12	2	3	47	----------	282
New Hampshire	527	165	38	8	81	1	6	8	18	201	----------	2,624
New Jersey	3,482	681	282	18	[4] 476	1	50	34	80	1,860	----------	12,717
New Mexico	820	83	64	4	[6] 12	39	101	7	25	486	----------	946
New York	17,164	3,205	1,436	77	6,062	4	147	157	435	5,641	[5]	11,414
North Carolina	2,197	404	171	34	30	48	186	46	202	1,077	----------	3,982
North Dakota	728	175	81	3	41	2	55	12	29	329	----------	19
Ohio	7,838	3,326	441	81	773	8	145	77	162	2,814	10	5,135
Oklahoma	3,581	1,490	417	49	41	12	252	34	174	1,112	----------	5,006
Oregon	1,091	496	94	13	99	13	20	19	30	307	----------	9,604
Pennsylvania	10,754	2,270	2,116	*414*	1,241	11	234	113	297	4,057	----------	11,753
Rhode Island	683	171	65	2	[6] 162	[5]	5	9	16	253	----------	3,025
South Carolina	1,702	224	65	9	19	39	133	30	77	1,079	27	3,085
South Dakota	854	284	53	4	53	8	86	11	28	328	----------	61
Tennessee	2,070	405	270	20	[7] 15	9	200	41	133	977	----------	6,828
Texas	7,119	3,290	200	64	77	49	418	85	336	2,599	----------	13,710
Utah	1,073	396	170	5	94	2	18	17	24	348	----------	1,748
Vermont	265	97	24	4	26	1	6	6	16	87	----------	24
Virginia	1,248	206	103	14	53	15	132	37	107	581	----------	16,379
Washington	3,350	2,149	213	36	157	11	33	29	82	640	----------	8,878
West Virginia	2,374	406	377	23	159	4	128	18	166	1,093	----------	1,658
Wisconsin	3,713	1,280	470	46	460	25	92	50	136	1,154	----------	2,197
Wyoming	250	89	26	4	18	2	16	4	12	89	----------	89

[1] See footnotes to table 1.

[2] Figures in italics represent programs administered under State laws from State and/or local funds without Federal participation.

[3] Partly estimated; does not represent sum of State figures, because total payments for medical care, hospitalization, and burial in 3 States have been excluded.

[4] Includes total payments for medical care, hospitalization, and/or burial.

[5] Less than $500.

[6] Data represent approximately 70 percent of total expenditures; exclude assistance in kind and, for a few counties, cash payments.

[7] Estimated.

[8] State program only; excludes program administered by local officials.

[9] Partly estimated.

Table 10.—*Public assistance and Federal work programs: Recipients of assistance and persons employed in the continental United States, by State, April 1942* [1]

State	Recipients of assistance						Persons employed under Federal work programs					Persons employed on regular Federal construction projects
	Special types of public assistance [2]				Cases receiving general relief	Cases for which subsistence payments were certified by the Farm Security Administration	Civilian Conservation Corps	National Youth Administration		Work Projects Administration	Other Federal agency projects financed from emergency funds	
	Old-age assistance	Aid to dependent children		Aid to the blind				Student work program	Out-of-school work program			
		Families	Children									
Total	2,245,104	400,534	962,748	78,278	[3] 723,000	[4] 23,859	76,105	236,975	205,027	837,264	362	1,332,213
Alabama	21,094	5,645	16,106	648	2,292	1,078	3,097	6,022	6,364	19,051	----------	57,304
Arizona	9,424	2,375	6,323	403	2,772	924	1,956	873	797	2,947	----------	10,669
Arkansas	25,004	6,345	16,371	1,168	3,813	687	2,491	3,501	5,162	18,093	----------	24,918
California	158,312	14,289	34,009	7,237	29,346	3,632	1,739	11,030	4,792	31,825	----------	134,877
Colorado	42,897	6,166	15,223	640	[5] 10,333	367	685	2,752	2,557	9,446	33	2,760
Connecticut	17,738	1,527	3,814	299	6,231	----------	153	1,939	1,952	3,139	----------	14,220
Delaware	2,364	504	1,495	----------	588	3	33	327	430	959	----------	4,655
District of Columbia	3,598	1,137	3,294	276	1,844	----------	218	936	615	2,552	5	23,903
Florida	41,949	5,790	13,718	2,731	7,198	117	1,721	3,033	3,369	18,055	----------	22,798
Georgia	63,320	4,658	11,396	1,952	5,403	1,734	3,034	5,775	7,556	19,473	----------	30,154
Idaho	9,816	3,080	7,877	277	[6] 1,185	152	292	1,381	969	4,275	----------	21,559
Illinois	150,266	22,910	51,682	*7,512*	90,714	279	2,437	11,424	10,260	56,839	116	0,519
Indiana	70,458	15,305	31,792	2,359	[5] 21,755	270	822	6,184	4,458	19,615	2	2,975
Iowa	56,693	*5,225*	*7,188*	1,538	16,398	63	539	4,763	3,782	12,681	----------	4,543
Kansas	31,048	6,676	16,015	1,344	9,994	144	810	4,714	3,821	12,257	----------	8,861
Kentucky	58,157	[7] *430*	[7] *1,420*	----------	[7] 4,300	289	4,429	5,017	6,558	20,917	----------	22,622
Louisiana	35,553	15,242	38,753	1,312	11,795	1,056	2,386	4,439	5,020	18,545	----------	34,939
Maine	15,466	1,810	4,963	1,081	5,132	75	230	1,296	2,201	2,412	----------	20,644
Maryland	16,880	5,764	15,976	630	6,752	81	410	2,479	2,061	4,130	----------	26,442
Massachusetts	87,146	12,324	30,166	1,129	31,700	4	809	7,317	5,130	31,405	----------	[8] 4,121
Michigan	93,005	21,236	49,272	1,392	33,086	295	2,015	8,237	6,455	31,359	----------	17,033
Minnesota	63,422	9,246	22,048	1,017	20,433	537	1,803	5,187	4,918	22,763	----------	10,779
Mississippi	27,277	2,619	6,727	1,345	587	1,704	2,799	4,056	4,095	17,021	----------	26,609
Missouri	116,384	14,223	32,565	*[7] 8,000*	15,121	1,962	2,643	6,570	5,703	30,058	----------	43,841
Montana	12,488	2,657	6,570	321	2,656	474	726	1,758	1,039	5,488	----------	1,256
Nebraska	29,648	5,620	12,586	735	5,597	166	678	2,931	1,852	11,013	22	1,985
Nevada	2,243	*112*	*227*	*27*	431	3	185	238	139	690	----------	2,105
New Hampshire	7,295	805	2,031	331	3,398	12	83	916	682	2,812	----------	13,536
New Jersey	30,263	8,878	20,220	731	[5] 19,811	19	743	5,614	2,927	24,296	----------	62,461
New Mexico	5,110	2,337	6,847	231	[9] 1,273	1,139	1,540	1,076	1,088	7,112	----------	11,410
New York	120,679	28,972	57,377	2,783	[9] 161,378	69	2,193	22,087	15,956	72,534	2	61,098
North Carolina	39,206	10,002	23,521	2,236	4,220	677	2,773	6,893	8,895	18,689	----------	29,597
North Dakota	9,531	2,532	7,036	138	2,711	60	854	2,054	1,088	5,663	----------	166
Ohio	139,345	11,682	30,608	3,940	38,936	162	2,160	11,074	5,957	40,599	27	28,944
Oklahoma	77,625	19,557	45,107	2,189	[10] 8,507	369	3,834	5,319	6,437	23,509	----------	31,547
Oregon	21,812	2,086	4,924	468	4,906	450	296	2,275	1,140	3,581	----------	58,824
Pennsylvania	99,460	52,558	132,194	*15,901*	62,285	204	3,481	16,255	11,657	56,658	----------	67,702
Rhode Island	7,436	1,257	3,513	99	[11] 4,735	1	79	1,133	717	3,199	----------	15,189
South Carolina	20,473	4,011	11,759	805	2,266	2,299	1,982	5,162	3,462	17,243	155	17,156
South Dakota	14,853	1,844	4,315	250	3,617	228	1,370	1,972	1,158	5,957	----------	617
Tennessee	35,827	14,052	34,741	1,563	[7] 2,300	126	2,973	7,054	6,522	18,809	----------	44,428
Texas	169,055	9,599	20,569	2,808	8,439	827	6,229	11,250	13,829	50,862	----------	90,549
Utah	14,667	3,877	10,150	174	3,470	21	272	2,181	1,054	3,960	----------	11,198
Vermont	5,525	727	1,946	162	1,423	(4)	90	776	582	1,576	----------	289
Virginia	20,011	5,024	14,448	1,082	4,967	212	1,968	5,219	4,956	9,942	----------	82,232
Washington	64,295	5,103	12,377	1,017	6,892	332	504	3,581	2,900	7,849	----------	43,922
West Virginia	23,158	12,238	32,438	1,017	14,368	56	1,900	2,825	6,045	18,129	----------	8,944
Wisconsin	54,249	11,710	27,037	1,934	20,144	418	1,394	7,528	5,437	16,034	----------	14,650
Wyoming	3,579	768	2,014	136	1,001	83	247	552	483	1,243	----------	663

[1] See footnotes to table 2.

[2] Figures in italics represent programs administered under State laws from State and/or local funds without Federal participation.

[3] Partly estimated; does not represent sum of State figures, because an estimated number of cases receiving medical care, hospitalization, and/or burial only in 3 States has been excluded, and data on cases aided in Oklahoma have been estimated to exclude duplication.

[4] Total includes data for Vermont, where number of cash grant payments canceled during month exceeded by 1 number of cash grant payments issued.

[5] Includes unknown number of cases receiving medical care, hospitalization, and/or burial only.

[6] Excludes cases receiving assistance in kind only and, for a few counties, cash payments.

[7] Estimated.

[8] State program only; excludes program administered by local officials.

[9] Includes cases receiving medical care only; number believed by State agency to be insignificant.

[10] Represents 3,583 cases aided under program administered by State board of public welfare, and 4,924 cases aided by county commissioners; amount of duplication believed to be large.

[11] Partly estimated.

EMPLOYMENT SECURITY

BUREAU OF EMPLOYMENT SECURITY • REPORTS AND ANALYSIS DIVISION

Operations of the Employment Security Program

Labor-Market Developments

At the beginning of the year approximately 6.9 million workers were engaged in nonagricultural activities necessary for the prosecution of the war. By the end of June, it is estimated, this figure had reached 12.5 million. It must be raised to 17.5 million by the end of this year and to 20.0 million by December 1943. All but 2 million of the additional war workers needed during the entire year 1942, it is anticipated, will be drawn from nonagricultural establishments engaged in civilian production, employment in which is expected to shrink from 29.8 million as of December 1941 to 20.5 million by the end of this year and to 19.1 million by the end of 1943. One out of every three men between the ages of 20 and 65 is now working directly in the war effort, either in industry or the armed forces; by Christmas, one out of every two will be so engaged.

The number of civil nonagricultural employees, as estimated by the Bureau of Employment Security, rose to 36.2 million in May, a gain of 434,000 over the previous month compared with a March–April increase of 381,000. Although employees in nonagricultural work totaled 2.3 million above last May, 1.8 million more employees will have to be added to the pay rolls to attain the December 1942 goal of 38.0 million. In addition, millions of workers must be kept at work in the fields.

Within the group of nonagricultural industries, considerable shifts of employees from nonwar to war work must take place by the end of the year. Manufacturing employment, which totaled approximately 14 million in May, must be raised to 16.5 million, mining employment from 960,000 to 1 million, transportation and public-utilities employment from 3.4 million to 3.5 million, and employment in governmental service from 4.8 million to 5.2 million. At the same time, employment in the contract-construction industry must be reduced from 2 million to 1.7 million, in wholesale and retail trade from 6.7 million to 6 million, and in finance and service and miscellaneous industries from 4.3 million to 4.1 million.

Eight directives to "promote effective mobilization and utilization of the Nation's manpower" were issued by the War Manpower Commission on June 25. Collectively, these directives constitute a program to coordinate information regarding manpower supply and to channel available manpower where it is needed—into the armed forces, industry, and agriculture. Four of the directives were addressed to the U. S. Employment Service, making clear the primary role which that agency is to play in all-out mobilization along the home front. The Employment Service was directed to prepare and maintain lists of essential activities and occupations, as well as lists of occupations in which shortages exist; to analyze and classify occupational questionnaires distributed by the Selective Service System; to interview individuals with skills in critical war occupations and to refer such individuals to job openings in war production; to alleviate critical production shortages by making preferential referrals of workers to war-industry employment in order of priority; and to expand the activities which would ensure an adequate supply of agricultural workers. To carry out its responsibilities more effectively, the USES is completely converting to a war basis through the establishment of priority in service to essential employers and elimination or curtailment of certain less important services.

The plan by which a system of job priorities is established will be implemented by information supplied by the War Production Board. That Board is charged by the War Manpower Commission with the task of furnishing "current information with respect to the relative importance, in connection with the maintenance and effectuation of the national war supply program, of filling job openings in plants, factories or other facilities . . ." The WPB, in obtaining this information, may seek the aid of the War and Navy Departments, the Maritime Commission, the Department of Agriculture, the Army and Navy Munitions Board, "and such other departments and agencies as it may deem appropriate."

The directive to the Director of Selective Service

471924—42——4

Table 1.—*Summary of employment security operations, May 1942*

Item	Number or amount	Percentage change from—	
		April 1942	May 1941
Insurance activities:			
Initial claims (local office) [1]	582,576	−22.5	−4.2
Continued claims	2,970,060	−15.4	−24.1
Waiting-period	407,259	−28.1	−56.1
Compensable	2,562,801	−13.0	−14.2
Weeks compensated	2,568,595	−11.7	−13.4
Total unemployment	2,363,167	−12.1	−13.3
Part-total unemployment [2]	86,706	−5.3	
Partial unemployment [3]	116,011	−9.8	[3] −30.6
Gross benefits paid	$31,704,306	−12.7	+.4
Net benefits paid since benefits first payable	$1,879,952,820		
Number of benefit recipients:			
Estimated individuals during month	858,100	−12.3	
Weekly average for month	609,734	−8.8	−7.5
Placement activities:			
Placements [4]	782,460	+29.3	+26.0
Agricultural [4]	181,552	+257.6	+37.6
Nonagricultural [5]	600,078	+8.3	+23.1
Applications (new and renewed) [4]	1,563,192	−.7	+1.7
Active file, May 31, 1942 [4]	4,252,457	−3.2	−17.4

[1] Excludes Alaska; data not reported.
[2] Excludes Rhode Island; data not reported.
[3] 34 States reported this type of payment during both periods.
[4] Excludes Hawaii; data not reported.
[5] Excludes Alaska and Hawaii; data not reported.

calls for close collaboration between the Selective Service System and the USES to the end that persons engaged in essential war activities shall be temporarily deferred from military training and service and that individuals not now engaged in essential activities but who are qualified for such occupations shall be afforded reasonable opportunity to become so engaged.

Two of the directives, addressed to the Secretary of Agriculture and to "certain Government agencies," respectively, concern the housing and transportation of the additional transient agricultural workers essential to this summer's "Food for Victory" harvest. The Secretary of Agriculture is instructed to gather information on housing facilities in areas which will require nonlocal agricultural workers and to make certain that additional labor-camp facilities are established where necessary. The transportation directive calls on the USES, the Department of Agriculture, and "any other department or agency having information concerning workers transferring to, moving between, or engaged in essential activities" to transmit information regarding transportation needs to the Office of Defense Transportation. Under the Executive Order by which it was established, the Office of Defense Transportation is responsible for assuring adequate transportation facilities for war workers.

Developing labor stringencies in the major labor-market areas were again indicated by preliminary reports to the Bureau of Employment Security for June 1942. Of 153 labor-market areas, each of which had a total employment of 100,000 or more or a known demand for at least 5,000 war production workers, 53—or 1 less than in May—had an adequate supply of local male labor for the present and the foreseeable future. In 67 areas—6 more than in the previous month—a shortage of male labor was anticipated; and in 33—an increase of 2 over May—a shortage of local male labor already existed. More than half the major labor-market areas still reporting a present and anticipated adequate labor supply are located in the South. Areas anticipating shortages of local male labor are scattered, but the largest number are former centers of automobile production which are still in the process of conversion to war production. Areas of current shortage are mainly shipbuilding and aircraft centers or smaller cities in which new large ordnance plants are already in operation.

Labor shortages are expected to develop before September in 138 of 491 selected skilled and semiskilled occupations essential to war industries, according to Bureau of Employment Security forecasts. These forecasts are based on a comparison of Employment Service registrants in mid-March and estimates of workers to be laid off during the 6 months from March through August, on the one hand, with labor needs for the March–August period reported by employers of 50 or more workers in 63 war industries, on the other. Deficits of more than 1,000 workers are anticipated in 42 occupations as compared to the 30 predicted on the basis of January data. In 58 occupations, shortages of 100–999 workers are expected; and in 38 occupations, deficits of less than 100. Half of all shortage occupations are in the metal-machining and assembly groups. Reporting employers planned to hire approximately 405,000 workers in the 491 selected war occupations by August 31, 1942. Practically two-thirds of this demand, or 268,000, is anticipated in the 42 occupations with predicted shortages of 1,000 or more. Only 22 percent or about 87,000 hires are anticipated in those occupations which have a surplus labor supply. Because of the fact that the peak of conversion lay-offs was reached in February, only 15,000 anticipated lay-offs were reported in

March for the following 6 months, whereas 50,000 had been predicted for January–June.

Although in some areas considerable progress has been made in placing nonwhite workers in war work, in others strong racial barriers prevent the full utilization of the labor supply. Shipbuilding companies in Louisiana, Pennsylvania, and Delaware are planning to staff entire new shipways with Negro workers. Other yards are beginning to upgrade Negroes into skilled and semiskilled jobs or to hire nonwhite workers for the first time. But reports to the Bureau of Employment Security indicate that, in one Southern city, an ordinance prohibiting the employment of Negroes in semiskilled and skilled occupations except in the colored sections of the city has resulted in the arrest of Negro workmen at the local shipyard. A municipal ordinance barring Negroes from overnight residence within the limits of a West Coast city is impeding recruitment and adding to turnover problems. The ruling of the Attorney General of Oklahoma, that it would be illegal for Negroes to be trained by white teachers, has obstructed training of Negroes for the aircraft industry. Only 6,700 or 2.8 percent of the 240,000 Employment Service placements in 60 war industries during the first quarter of 1942 were of nonwhite workers, although the latter constituted about 11 percent of the total labor force. To work for the full utilization of Negroes in the training and employment phases of the war production program, a Negro Manpower Service has been established within the War Manpower Commission, and the USES is making every effort to improve its service to Negro workers.

Migration of rural population to industrial centers and induction of farm youth into the armed forces continued to drain the agricultural labor supply. However, crop losses and harvesting delays were limited for the most part to areas in which reserve labor supplies were not utilized. Moreover, despite the shortage of dairy workers, production of milk remained at levels higher than in 1941. The chief difficulties in recruiting farm workers were still attributed by local offices of the USES to low wages, lack of adequate housing, and transportation problems. Agricultural employment rose 1.1 million during May and totaled 11.9 million on June 1, according to the Department of Agriculture. This change represented a normal increase for the month. Almost one-fourth of the 783,000 jobs filled by the Employment Service in May were in agricultural occupations.

Housing shortages are reported to be discouraging in-migration and stimulating high labor turnover in many localities including Vallejo and neighboring California communities; La Porte, Indiana; Akron, Dayton, Piqua, and Troy, Ohio; Portland, Oregon; and Charleston, South Carolina. Inadequate housing is reported to be the main cause of a labor stringency at the mines in Morenci and Clifton, Arizona, and the primary reason for workers quitting the shipyards at Mobile, Alabama, where 100 workers are reported to have moved out on a single day, recently. Crowded housing conditions in Bath and Portland, Maine, have caused numbers of workers to quit the shipyards when it became apparent they would be unable to bring their families into the area. Key skilled workers are being kept away from Charleston shipyards chiefly because of the distressing local housing conditions. Similar problems are expected to develop in other shipbuilding centers as housing fails to keep pace with expanded hiring programs. The regional director of the National Housing Agency warns that the housing shortage in Detroit and neighboring industrial areas, where an influx of 150,000 workers is expected, may become so acute that billeting of war workers in private homes will be necessary.

Transportation problems are commonly found in the same areas as housing problems, one accentuating the other. Either congested housing conditions force workers to move to outlying districts, further taxing transportation facilities, or tire and gas shortages lead to crowding in sections near war plants. To help prevent gasoline rationing from interfering with work on war contracts, the Office of Price Administration recently revised regulations to permit operators of gasoline stations to favor workers in war factories.

Placement Activities

With agriculture and industry intensifying their efforts to produce an ever-increasing volume of materials needed for the war, the number of jobs filled by the United States Employment Service increased sharply for the third successive month, rising 29 percent above the April total and 26 percent above that for last May to approximately 783,000 (table 2). Although April–May increases occurred in both agricultural and nonagricultural

placements, it was the spurt in the number of agricultural jobs filled which accounted for the major part of the gain in the total. While 39 States reported increases, the sharpest gains—in

Table 2.—*Summary of nonagricultural and agricultural placements, by State, May and January–May 1942*

[Corrected to June 22, 1942]

Social Security Board region and State	Total					Nonagricultural					Agricultural				
	May 1942			Jan.–May 1942		May 1942			Jan.–May 1942		May 1942			Jan.–May 1942	
	Number	Percentage change from—		Number	Percentage change from Jan.–May 1941	Number	Percentage change from—		Number	Percentage change from Jan.–May 1941	Number	Percentage change from—		Number	Percentage change from Jan.–May 1941	Percent of all placements
		April 1942	May 1941				April 1942	May 1941				April 1942	May 1941			
Total [1]	782,460	+29.3	+26.0	2,765,227	+14.9	600,078	+8.3	+23.1	2,441,215	+17.6	181,552	+257.6	+37.6	323,182	−2.0	11.7
Region I:																
Connecticut	9,610	+.6	+1.3	46,356	+12.3	9,351	+.6	+.7	45,581	+12.4	259	+2.4	+34.2	775	+9.0	1.7
Maine	5,251	+7.0	+14.5	21,268	+38.7	5,081	+4.9	+14.4	20,897	+39.0	170	+169.8	+15.6	371	+24.1	1.7
Massachusetts	10,633	−8.8	+3.0	50,939	+27.8	10,529	−8.6	+3.1	50,582	+28.1	104	−20.6	−6.3	357	−1.1	.7
New Hampshire	2,147	−.4	−15.7	9,625	−3.5	2,047	−1.5	−18.1	9,352	−4.6	100	+28.2	[2]	273	+59.6	2.8
Rhode Island	2,825	+3.9	+12.8	13,444	+30.6	2,802	+4.8	+12.8	13,350	+30.7	23	[2]	[2]	94	+25.3	.7
Vermont	732	−32.0	−47.6	4,031	−22.5	669	−34.7	−49.7	3,817	−23.4	63	+18.9	−4.5	214	−3.6	5.3
Region II:																
New York	68,124	+3.1	+34.0	286,294	+36.0	67,467	+3.0	+34.0	284,328	+36.3	657	+17.3	+30.6	1,966	+2.8	.7
Region III:																
Delaware	1,558	+7.4	−15.2	6,695	−4.8	1,548	+8.1	−15.1	6,652	−4.7	10	[2]	[2]	43	[2]	.6
New Jersey	17,632	+.7	+1.1	81,825	+13.3	16,559	−4.5	−2.9	80,342	+12.9	1,073	+509.7	+179.4	1,483	+43.7	1.8
Pennsylvania	29,003	+12.3	+22.8	121,040	+31.3	28,568	+12.1	+22.0	119,868	+31.0	435	+22.9	+117.5	1,172	+73.1	1.0
Region IV:																
Dist. of Col.	6,374	−4.7	+4.2	30,135	+15.1	6,355	−4.3	+4.2	30,053	+14.9	19	[2]	[2]	82	[2]	3
Maryland	8,734	[2]	+17.0	36,509	+29.0	8,409	−2.8	+20.4	35,941	+30.4	325	+316.7	−31.9	568	−23.3	1.5
North Carolina	26,097	+46.8	+45.8	82,106	−32.2	20,883	+24.0	+52.3	74,771	−35.5	5,214	+460.0	+24.3	7,335	+41.2	8.9
Virginia	8,782	−5.6	−33.0	41,850	−20.2	8,660	−6.1	−25.9	41,564	−18.3	122	+43.5	−91.5	286	−81.7	.7
West Virginia	4,352	−6.5	−2.4	17,152	−9.8	4,312	−6.9	−3.0	17,064	−9.8	40	[2]	[2]	88	+10.0	.5
Region V:																
Kentucky	22,003	+314.2	+310.8	38,369	+109.2	9,551	+81.9	+119.7	25,745	+49.7	12,452	[4]	[4]	12,624	[4]	32.9
Michigan	19,342	+3.8	+5.0	75,153	+14.5	18,689	+3.3	+5.4	73,544	+15.2	653	+22.1	−5.9	1,609	−10.2	2.1
Ohio	39,411	+5.0	+30.2	150,118	+35.6	37,871	+4.3	+27.1	146,676	+34.6	1,540	+25.4	+211.1	3,442	+97.9	2.3
Region VI:																
Illinois	28,880	+14.2	+5.9	113,463	+4.3	24,242	−1.1	−7.1	106,977	+.9	4,638	+494.6	+295.1	6,486	+141.7	5.7
Indiana	18,381	+19.7	−3.2	67,972	+3.2	17,614	+16.2	−6.5	66,725	+2.3	767	+281.6	+440.1	1,247	+91.8	1.8
Wisconsin	13,968	+14.0	+11.9	51,727	+17.5	13,255	+13.0	+11.3	49,544	+18.2	713	+34.8	+22.9	2,183	+5.0	4.2
Region VII:																
Alabama	7,449	−19.1	−25.0	40,024	+58.7	5,296	−34.0	−20.0	36,107	+71.4	2,153	+82.6	−35.1	3,917	−5.7	9.8
Florida	11,507	+22.8	+169.3	38,879	+15.1	10,210	+32.7	+147.8	34,373	+6.4	1,297	−22.7	+747.7	4,506	+205.7	11.6
Georgia	8,428	−4.6	−29.1	36,848	−15.5	8,189	−5.6	−21.7	36,198	−12.9	239	+48.4	−83.2	650	−68.4	1.8
Mississippi	7,354	+61.6	+46.6	24,341	+35.9	6,168	+38.9	+27.8	22,664	+35.6	1,186	+968.5	+530.9	1,677	+39.5	6.9
South Carolina	6,315	−10.8	−16.4	29,451	−20.7	6,079	−12.3	−11.8	28,936	−19.5	236	+62.8	−64.2	515	−57.8	1.7
Tennessee	18,118	+142.7	−3.6	45,180	−45.9	6,924	−5.6	−38.3	33,543	−20.8	11,194	[4]	+47.6	11,637	−71.7	25.8
Region VIII:																
Iowa	8,796	+3.5	−12.6	33,525	−13.6	8,015	+8.4	−14.4	29,857	−15.0	781	−28.9	+10.5	3,668	−.6	10.9
Minnesota	9,458	+9.1	−6.6	34,360	+11.0	8,447	+13.1	−2.3	30,171	+16.8	1,011	−16.2	−32.0	4,189	−18.4	12.2
Nebraska	7,406	+52.6	+80.1	19,488	+48.5	7,211	+58.0	+86.8	18,577	+51.3	195	−32.3	−22.9	911	+8.1	4.7
North Dakota	2,239	−8.0	−24.2	8,942	−9.5	1,804	+2.8	−21.7	6,977	−6.9	435	−35.9	−33.2	1,965	−17.9	22.0
South Dakota	2,392	+.1	+.8	7,717	+14.6	2,081	+1.2	−2.6	6,682	+13.7	311	−6.6	+31.8	1,035	+21.5	13.4
Region IX:																
Arkansas	82,319	+374.9	+99.8	139,821	+71.0	12,437	+22.8	+256.5	51,832	+197.7	69,882	+869.5	+85.3	87,989	+36.8	62.9
Kansas [5]	8,834	+23.0	.....	40,236	.....	8,416	+23.3	.....	38,678	.....	418	+15.8	.....	1,558	.....	3.9
Missouri [5]	24,314	+29.5	.....	80,946	.....	18,837	+18.1	.....	71,631	.....	5,477	+93.2	.....	9,315	.....	11.5
Oklahoma	12,349	+97.1	+92.3	34,258	+40.7	6,498	+35.6	+29.0	26,343	+29.0	5,851	+297.2	+321.8	7,915	+101.9	23.1
Region X:																
Louisiana	6,035	−8.0	−34.5	30,241	−41.2	5,865	+3.0	−32.0	28,937	−42.1	170	−80.3	−71.0	1,304	−9.1	4.3
New Mexico	5,513	+91.1	+154.9	13,412	+58.6	3,752	+51.4	+184.2	10,625	+56.4	1,761	+332.7	+108.9	2,787	+67.6	20.8
Texas	71,655	+42.3	+18.7	264,137	+1.8	49,923	+31.3	+66.2	193,119	+17.1	21,732	+76.1	−28.3	71,018	−24.9	26.9
Region XI:																
Arizona	6,249	+30.7	−4.8	26,871	−31.6	3,397	+7.8	+.9	14,909	+5.5	2,852	+74.8	−10.8	11,962	−52.4	44.5
Colorado	7,840	+19.6	+31.1	24,148	+39.5	6,186	+13.9	+55.8	20,378	+45.3	1,654	+46.9	−17.6	3,770	+14.5	15.6
Idaho	7,180	+76.0	+41.9	16,525	+30.1	2,945	+8.8	+34.7	9,777	+21.5	4,235	+208.9	+47.4	6,748	+45.0	40.8
Montana	4,026	+24.3	+24.9	10,961	+18.0	2,266	+22.0	+1.2	6,995	+5.3	1,760	+27.3	+78.9	3,966	+50.0	36.2
Utah	3,958	+25.3	+44.9	13,648	+65.0	3,527	+17.2	+56.3	13,019	+70.7	431	+187.3	−9.3	629	−1.9	4.6
Wyoming	1,832	+34.2	+20.4	5,257	−23.8	1,517	+36.3	+21.5	4,308	−32.0	315	+25.0	+15.8	949	+68.3	18.1
Region XII:																
California	68,522	+5.2	+55.9	270,325	+61.8	58,550	−5.1	+56.8	247,209	+62.6	9,972	+189.7	+51.0	23,116	+54.4	8.6
Nevada	3,131	+13.3	+56.2	11,420	+58.2	2,938	+17.0	+60.5	10,509	+62.2	193	−23.4	+10.9	911	+23.3	8.0
Oregon	15,825	+68.1	−8.6	46,939	+.3	12,805	+54.1	+41.8	41,370	+15.3	3,020	+172.3	−63.5	5,569	−49.0	11.9
Washington	18,747	+10.6	+85.6	63,762	+55.0	15,333	−1.9	+93.7	57,499	+58.0	3,414	+160.2	+56.2	6,263	+31.6	9.8
Territories:																
Alaska	830	+14.2	−44.7	3,544	−6.7	[3]	.....	.....	[6] 2,701	+18.1	[3]	.....	.....	[6] 13	[2]	[6] .5
Hawaii [6]	.....	.....	.....	3,950	−8.0	.....	.....	.....	3,918	−7.6	.....	.....	.....	32	[2]	.8

[1] Does not include May data for Hawaii and includes only total placements for Alaska. All percentages based on comparable data.

[2] Not computed, because less than 50 placements were made in 1 or both periods.

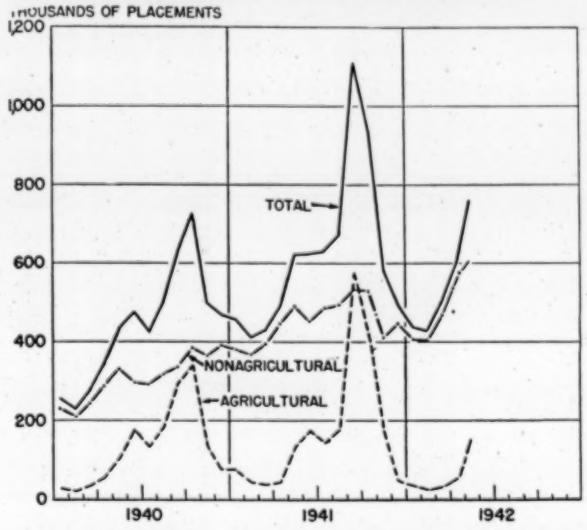
[3] Increase of less than 0.05 percent.

[4] Increase of more than 1,000 percent.

[5] Beginning Feb. 16, data for Kansas City, Kans., included with Kansas City, Mo.

[6] Data not reported for May 1942.

Chart 1.—*Placements of men and women by public employment offices, January 1940–May 1942*



Arkansas, Idaho, Kentucky, New Mexico, Oklahoma, and Tennessee—reflected employment service activity in placing workers in farm jobs. In the first 5 months of the year, 2.8 million jobs were filled by public employment offices.

The 182,000 farm-work placements in May were more than 3½ times as numerous as in April, a considerably sharper increase than for the same period of the past 2 years. Except for the harvest peak months of September and October of 1940 and 1941, this was the highest monthly total on record since comparable data first became available in January 1940. The 900-percent rise in agricultural placements in Arkansas, mainly on fruit and nut farms, accounted for about half the increase over April in farm placements; almost two-fifths of all agricultural placements were in this State. A fourth of the April-May gain was attributable to large increases in Kentucky, Tennessee, and Texas; these States also accounted for one-fourth of all agricultural placements.

Despite the large May increase, the 323,000 farm-work placements made during the first 5 months of the year were 2.0 percent fewer than in the corresponding period last year because of the low volume of such placements in the first months of 1942. They were, however, 39 percent greater than in the same period of 1940.

[1] The May report for Hawaii was not received in time for inclusion, and the Alaska report did not separate agricultural and nonagricultural placements; totals for other months have been adjusted for comparability.

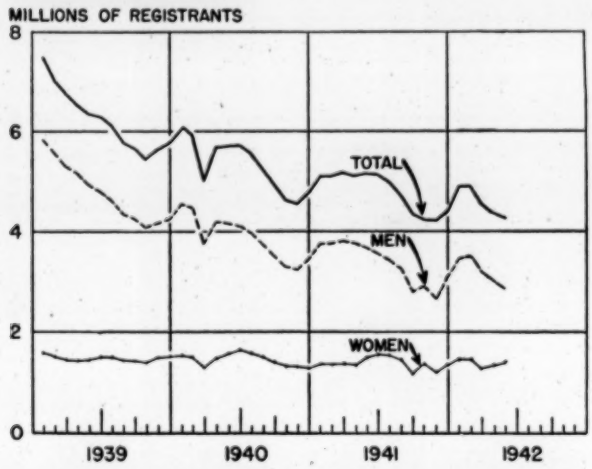
The 600,000 [1] nonagricultural placements—8.3 percent above the April level—represented the highest monthly total since 1935, when large numbers of placements of relief recipients served to swell the totals. Nonagricultural placements were almost one-fourth more numerous than in May 1941 and were four-fifths above the May 1940 level. In addition, the number of nonagricultural jobs filled in January–May 1942 aggregated 2.4 million, 18 percent greater than in the same period last year and 88 percent greater than in the first 5 months of 1940.

Most of the April–May gain in nonagricultural placements occurred in the less industrialized areas of the country; a majority of the leading industrial States registered declines or less-than-average increases. The sharpest increases in nonagricultural placements were reported by a number of predominantly agricultural States, such as Kentucky, Mississippi, Nebraska, Oklahoma, and Texas, and reflected the growing shift of a significant part of the war production and building program toward the interior regions of the country. The extraordinary industrial and construction activity in a number of previously nonindustrial States is likewise indicated by the large increases in nonagricultural placements—ranging from 120 to 257 percent—over last May in several of these States. On the other hand, declines from April were reported by 15 States, including California, Illinois, Maryland, Massachusetts, New Jersey, and Washington. In each of these 6 States except Illinois and New Jersey, however, placements were greater than last May.

Approximately 390,000 different individuals were placed in nonagricultural occupations by public employment offices in the 46 States [2] reporting data for May; the total for the first 5 months of 1942 was nearly 1.7 million. Although strictly comparable data for 1941 are not available, the number of different individuals placed in nonagricultural jobs during January–May 1942 was about one-sixth greater than the total placed in both agricultural and nonagricultural jobs during the same period last year. Continuing the steady rise begun early this year, the average number of nonagricultural jobs filled per 100 individuals placed rose from 133 in April to 136 in May. In

[2] Excludes Alaska, Hawaii, Rhode Island, Michigan, and Oregon; data not reported.

Chart. 2—*Active file of men and women registrants at public employment offices as of end of month, January 1939–May 1942*



several States, however, the ratio was substantially higher, chiefly because of large numbers of short-term domestic-service placements.

Active file.—The active file of job seekers registered with public employment offices declined during May for the fourth successive month. It dropped 141,000 [3] below the April level to a total of nearly 4.3 million at the close of May (table 3). Except for October and November 1941, the file was the smallest in the history of the Employment Service. The registrants in the file numbered 898,000 [3] fewer than last May; all but 8 [4] of the 48 States for which comparable data are available shared in the decline.

While the number of women registered in the active file increased for the second successive month, the number of men sank to the lowest level on record. Women registrants increased by 40,300 or 3.0 percent during May to a total of 1.4 million, and men registrants dropped by 181,300 or 6.0 percent to a total of 2.8 million. In comparison with last May, the number of women job seekers, however, was down only 4.5 percent while the number of men declined 23 percent. The influx of women formerly not in the labor market accounts in part for the relatively smaller drop in women registrants.

Vocational Training Activities

Faced by increasing labor shortages in the expanding war industries, the United States Employment Service referred more persons to training courses and placed more trainees in jobs in April than in any previous month. The 20,400 placements made by the Employment Service (table 4)

[3] Excludes Hawaii; data not reported.

[4] Arizona, Indiana, Michigan, Minnesota, New Mexico, Oklahoma, South Carolina, and Washington.

Table 3.—*Total applications received and active file of applications in public employment offices, by State, May 1942*

[Corrected to June 19, 1942]

Social Security Board region and State	Total applications received, May 1942	Active file as of May 31, 1942		
		Number	Percentage change from—	
			Apr. 30, 1942	May 31, 1941
Total [1]	1,563,192	4,252,457	−3.2	−17.4
Region I:				
Connecticut	22,455	34,562	+.6	−11.1
Maine	10,666	19,781	−13.7	−36.2
Massachusetts	51,264	125,283	−1.6	−28.4
New Hampshire	5,120	10,468	−3.0	−33.8
Rhode Island	12,974	30,431	+16.6	−28.7
Vermont	1,917	6,074	−.7	−34.4
Region II:				
New York	187,488	424,784	+.1	−25.0
Region III:				
Delaware	2,642	8,146	−5.0	−5.4
New Jersey	55,396	141,182	−7.8	−24.6
Pennsylvania	113,869	258,994	+3.2	−21.2
Region IV:				
District of Columbia	8,573	12,190	−10.5	−45.2
Maryland	24,270	29,949	+1.6	−19.9
North Carolina	31,267	66,144	−7.6	−22.1
Virginia	18,354	40,741	−8.0	−41.7
West Virginia	16,063	49,193	+1.3	−27.1
Region V:				
Kentucky	21,187	82,911	−7.6	−13.5
Michigan	66,482	163,222	−6.8	+22.0
Ohio	98,535	185,320	−4.6	−35.4
Region VI:				
Illinois	94,540	249,696	−2.0	−12.6
Indiana	48,058	247,329	+1.7	+17.0
Wisconsin	27,626	72,466	−13.3	−23.0
Region VII:				
Alabama	23,870	60,420	+.4	−49.5
Florida	23,613	90,610	+2.0	−19.2
Georgia	25,925	84,574	−8.8	−27.1
Mississippi	19,702	65,928	−7.0	−17.8
South Carolina	14,107	57,154	+2.3	+21.2
Tennessee	17,742	128,973	+3.0	−4.8
Region VIII:				
Iowa	19,672	49,112	+1.4	−24.6
Minnesota	24,976	130,245	+3.7	+26.4
Nebraska	13,271	34,965	−16.5	−29.4
North Dakota	4,281	16,399	−4.2	−45.1
South Dakota	6,371	24,472	+2.1	−.7
Region IX:				
Arkansas	27,599	53,768	−11.0	−23.0
Kansas [3]	14,626	43,657	−5.5	(5)
Missouri [3]	53,405	253,861	+.5	(5)
Oklahoma	21,803	81,221	−18.7	+24.1
Region X:				
Louisiana	18,519	97,697	−.2	−9.4
New Mexico	6,645	24,955	−13.4	+3.7
Texas	97,215	280,286	+5.5	−15.6
Region XI:				
Arizona	6,829	27,001	−.6	+37.2
Colorado	11,685	33,095	−11.5	−43.3
Idaho	6,190	13,369	−17.4	−60.1
Montana	4,757	8,926	−6.3	−51.7
Utah	8,630	10,992	−27.9	−47.5
Wyoming	2,424	5,232	−10.9	−6.7
Region XII:				
California	116,536	254,042	−15.6	−32.2
Nevada	2,859	1,894	−2.0	−61.8
Oregon	24,333	17,369	−.9	−44.3
Washington	25,554	42,597	−7.4	+11.6
Territories:				
Alaska	1,307	777	+2.8	−56.3
Hawaii [4]				

[1] Excludes Hawaii for May; data not reported.

[3] Beginning Feb. 16, data for Kansas City, Kans., included with Kansas City, Mo.

[5] Data not comparable.

[4] Data not reported.

represented a 25-percent increase over the preceding month and brought the figure for the first 4 months of 1942 to 64,400, or more than 70 percent of the total number made by the Employment Service in the entire year of 1941. The NYA, WPA, and the vocational schools also reported increases in placements, from 26,300 in March to 31,500 in April. In addition, many trainees find jobs on their own initiative.

Despite difficulties in recruiting trainees in a number of localities, the Employment Service was able to increase its referrals to national defense pre-employment training courses in April by 12 percent, reaching a record high of 76,600. Referrals to NYA defense work projects increased by almost the same percentage to 8,900. The extent to which Employment Service referrals to pre-employment training courses have increased during the past 16 months is strikingly indicated by the rise in the average monthly referrals from 28,500 for 1941 to 65,000 for the first 4 months of 1942.

The U. S. Office of Education reported 105,000 new enrollments in pre-employment courses during April, 9,000 more than in March. The increasing number of women accepted for training accounted for much of the rise. Employment Service referrals constituted 82 percent of new enrollments in April compared with 79 percent in March and indicate the increasing importance of the Employment Service in supplying trainees to the pre-employment training program.

Employment Service referrals for training were most numerous in California, New York, Pennsylvania, and Ohio, four States which together accounted for 36 percent of all April referrals. The only State that reported a significant decrease was Pennsylvania, which experienced difficulty in recruiting trainees. Because the entering wage rates are especially attractive, young workers in this State prefer immediate employment to a non-remunerative training period. Most States, however, indicated substantial increases in the number of referrals, especially Illinois, Florida, Missouri, Texas, and Ohio, which together accounted for 65 percent of the total increase in April. Training courses in Ohio and Illinois, although greatly expanded, were unable to keep abreast of labor demand, especially for machine-shop trainees, because of a shortage of facilities and instructors. This resulted in long waiting lists of candidates.

Table 4.—*Public employment office referrals to pre-employment and refresher defense training courses, placements on NYA defense projects, and jobs found by trainees, April 1942* [1]

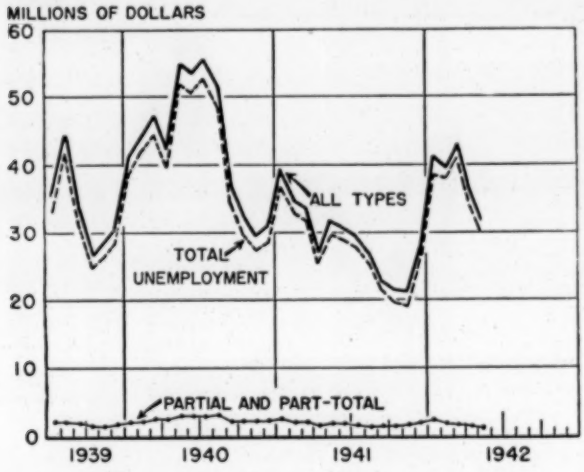
Item	Number
Referrals to training courses and placements on NYA defense projects, total	85,463
Nonwhite	3,759
White	81,704
Placements on NYA defense projects	8,903
Referrals to training courses	76,560
Aviation services	13,428
Machine shop	23,352
Sheet-metal work	3,788
Shipbuilding and boatbuilding	6,763
Welding	14,122
All other	15,107
Jobs found by trainees, total [2]	51,893
Placements by public employment offices	20,425
Employment reported by cooperating agencies	31,468

[1] Excludes Alaska and Hawaii.
[2] Represents jobs found by all trainees, regardless of agency which originally referred worker to training.

As in March, referrals to machine-shop training in April were more numerous than any other type of referral. More than 30 percent of the machine-shop referrals occurred in three important machine-manufacturing States—Ohio, Michigan, and New Jersey. Approximately 85 percent of the persons referred to shipbuilding pre-employment classes by the Employment Service are receiving training in Oregon, Washington, California, and Texas. Contrary to the general trend, the number of applicants for training directed by the Employment Service to pre-employment aviation courses dropped from 14,100 in March to 13,400 in April, largely because referrals declined by 2,200 in Maryland and California. In the major labor-market areas of these two States, critical labor shortages make it almost impossible to find trainees. In-migrants, previously an important source of trainees, are now discouraged by acute housing shortages from going into these areas.

Referrals of nonwhite applicants (mostly Negroes) to pre-employment courses and youth work projects rose substantially in April to 3,800, or 4.4 percent of all referrals. Although more nonwhite persons were sent to training courses by the Employment Service than during any other month of 1942, this proportion still compares unfavorably with the 10 percent of the total population which they represent. Maryland has been, for several months, the only State where Negroes were being trained in relatively large numbers, but during April referrals of nonwhite persons accounted for

Chart 3.—*Amount of unemployment benefits paid, by type of unemployment, by month, July 1939–May 1942*



18 percent of all referrals in Arkansas and 13 percent in Missouri. Almost 30 percent of the nonwhite referrals in the Nation were made in these three States.

Even more significant than the increase in Negro training is the trend in the training of women. Women are entering industry in unprecedented numbers and are satisfactorily filling jobs previously considered suitable only for men.[5] In many localities employers have requested the establishment of training schools for women exclusively. As a proportion of enrollments in pre-employment courses, women advanced from 5.5 percent in January 1942 to 13.1 at the end of April. The 20,000 additional women enrolled during April equaled more than two-fifths of the number enrolled in the program from its inception through March 1942.

Insurance Activities

The volume of unemployment among covered workers and the amount of benefits paid declined further during May, as an increasing number of persons continued to be drawn into both production and the armed services. Man-weeks of compensated unemployment (2.5 million) and benefit disbursements ($31.7 million) were, respectively, 12 and 13 percent below April levels (table 5), although the initiation of new benefit years in many States during April ordinarily presages an upturn in May. While payments were smaller than in May 1938, 1939, and 1940, they were slightly higher than in May 1941; on the other hand, the total number of man-weeks compensated was approximately one-eighth less than last May—an indication that liberalized benefit formulas and higher base-period earnings rather than a greater volume of unemployment accounted for the somewhat higher level of benefit payments. May was the first month since January that the number of man-weeks compensated was below that for the corresponding month of 1941. It may be expected that both claims and benefit disbursements will continue to drop as the number of workers who become unemployed declines. Because of heavy conversion unemployment in the early part of the year, payments for the first 5 months of 1942 aggregated $192 million, 16 percent more than in the same period last year.

Approximately 858,000 different individuals received at least one benefit payment during May. It is estimated that about 23 percent of the persons unemployed in May, as reported by the WPA, drew unemployment benefits, as compared with 22 percent of the unemployed during April.[6]

Claims and payments.—After a sharp rise in April following the initiation of new benefit years

[5] See "Employment of Women in War Production," in this issue of the Bulletin.

[6] Derived by dividing the number unemployed (WPA estimate) into the average weekly number of benefit recipients during the month. This procedure represents a change from that used previously, when the WPA unemployment figure was divided into the estimated number of different individuals in receipt of benefits during the month. The latter monthly cumulative figure was, however, not strictly comparable with the WPA estimate, based on a count of the unemployed during a single week. Under the revised procedure, the proportion of those unemployed who drew benefits during the first 3 months of 1942 was, respectively, 19, 21, and 22 percent, instead of 29, 30, and 33 percent as obtained by the previous method.

Chart 4.—*Number of initial claims received in local offices, by month, July 1939–May 1942*

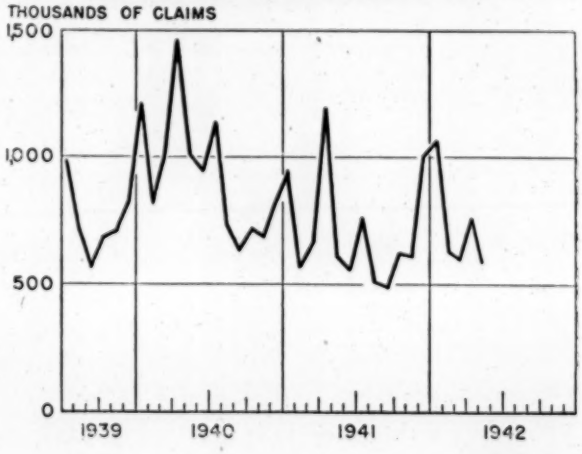


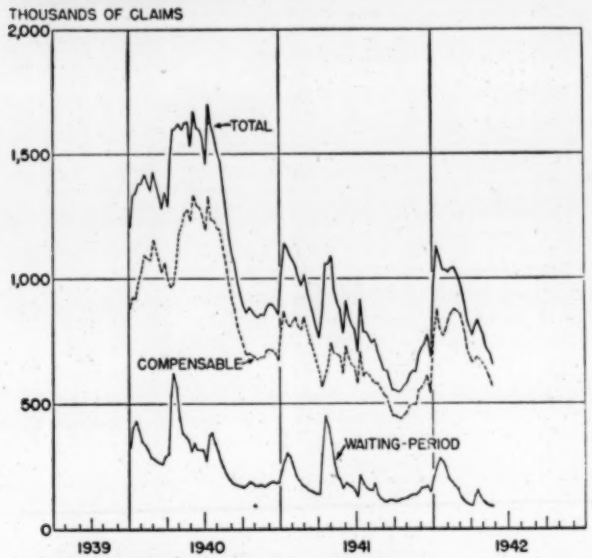
Table 5.—*Number of benefit recipients, number of weeks compensated, and amount of benefits paid, by State, May 1942*

[Data reported by State agencies, corrected to June 19, 1942]

Social Security Board region and State	Benefit recipients		Weeks compensated for—					Benefits paid[1]				
			All unemployment			Total unemployment				Type of unemployment		
	Average weekly number	Estimated number of different individuals during month	Number	Percentage change from—		Number	Percent of all weeks	Amount[2]	Percentage change from April 1942	Total	Part-total[3]	Partial[3]
				April 1942	May 1941							
Total	609,734	858,100	2,568,595	−11.7	−13.4	2,363,167	92.0	$31,704,306	−12.7	$30,042,754	[4] $761,558	[4] $857,474
Region I:												
Connecticut	5,611	10,300	25,005	+81.2	+64.1	22,855	91.4	322,900	+90.0	303,763	386	18,520
Maine	4,308	6,500	17,756	+28.1	−30.3	15,349	86.4	155,022	+32.1	137,633	9,446	7,943
Massachusetts	26,768	43,000	116,375	+22.6	−34.4	110,389	94.9	1,241,519	+21.9	1,206,567	6,665	27,010
New Hampshire	2,423	3,300	9,822	−22.5	−24.3	8,902	90.6	84,375	−23.2	79,221	512	4,642
Rhode Island	14,238	19,500	57,390	+14.1	+17.2	54,679	95.3	704,867	+37.8	686,078	(4)	(4)
Vermont	650	900	2,762	−35.1	−16.1	2,546	92.2	27,421	−36.0	25,944	689	787
Region II:												
New York	70,904	85,800	286,753	−26.6	−48.2	286,753	100.0	3,519,573	−26.0	3,519,573	(3)	(3)
Region III:												
Delaware	1,022	1,500	4,095	−38.9	−6.0	3,476	84.9	36,144	−37.9	32,434	612	3,028
New Jersey	22,353	34,300	93,469	−16.0	−11.9	82,092	87.8	1,193,232	−15.5	1,111,946	3,492	76,027
Pennsylvania	22,846	36,000	93,621	−23.8	−65.7	93,621	100.0	1,060,137	−24.3	1,060,137	(3)	(3)
Region IV:												
District of Columbia	1,687	2,200	7,071	−23.4	−52.2	6,730	95.2	91,245	−23.5	86,882	3,295	589
Maryland	9,850	14,200	41,381	+7.3	−26.6	36,192	87.5	493,469	+5.9	450,809	1,244	41,235
North Carolina	9,364	12,400	40,603	−7.2	−28.2	37,118	91.4	266,998	−9.0	254,831	2,169	9,809
Virginia	9,727	16,400	43,721	+127.2	−8.0	42,135	96.4	403,235	+131.6	392,981	7,462	2,756
West Virginia	4,897	9,000	21,023	+50.4	−55.6	20,776	98.8	243,221	+89.6	210,123	0	33,098
Region V:												
Kentucky	7,654	12,100	33,992	+1.9	−6.3	30,660	90.2	267,848	+1.3	251,263	10,031	5,441
Michigan	66,468	80,100	273,477	−33.7	+304.3	253,755	92.8	4,562,924	−34.3	4,421,170	59,066	82,688
Ohio	27,090	37,200	114,313	−14.4	+21.9	106,336	93.0	1,385,887	−15.4	1,326,336	28,947	29,010
Region VI:												
Illinois	70,974	118,100	314,222	+67.8	+34.9	275,357	87.6	4,364,584	+68.5	4,014,899	178,916	167,892
Indiana	17,412	23,900	74,859	−16.9	+147.7	66,748	89.2	897,447	−18.2	841,924	28,144	26,994
Wisconsin	6,922	9,400	28,665	−29.5	+133.4	24,675	86.1	355,679	−28.8	320,266	15,517	19,896
Region VII:												
Alabama	5,953	8,100	25,240	−14.5	−37.4	23,604	93.5	224,408	−12.4	213,167	9,561	1,563
Florida	9,400	13,400	40,337	−5.7	+9.8	37,018	91.8	419,592	−6.8	396,733	19,439	3,420
Georgia	10,061	13,900	45,307	−3.6	+28.3	43,795	96.7	412,177	−6.5	401,459	7,563	3,071
Mississippi	4,923	6,600	20,443	−18.9	+1.2	18,994	92.9	186,121	−17.5	177,462	4,527	4,108
South Carolina	4,988	6,700	20,742	−15.1	+21.0	19,392	93.5	166,569	−15.3	159,378	4,590	2,594
Tennessee	12,887	17,600	56,316	−8.1	+17.6	53,795	95.5	534,691	−9.7	517,776	12,725	4,190
Region VIII:												
Iowa	4,729	7,100	19,198	−27.5	−12.5	16,614	86.5	192,741	−28.0	176,080	10,781	5,370
Minnesota	9,624	12,500	38,523	−43.6	−30.6	33,353	86.6	457,289	−44.6	413,589	26,910	16,610
Nebraska	1,707	2,100	6,627	−44.9	−35.2	5,777	87.2	65,543	−47.2	59,090	3,415	2,997
North Dakota	808	1,000	3,336	−46.7	−28.5	2,800	83.9	33,069	−49.2	28,654	2,261	2,154
South Dakota	776	1,000	3,231	−1.3	−28.1	2,744	84.9	27,037	−5.0	23,608	2,152	1,228
Region IX:												
Arkansas	2,383	3,200	9,246	−35.4	−76.2	8,725	94.4	70,419	−38.2	67,425	1,926	1,068
Kansas	4,179	5,800	17,140	−28.2	+16.5	15,211	88.7	175,139	−28.9	161,455	8,441	5,243
Missouri	16,430	22,400	68,562	−9.6	+55.6	60,027	87.6	808,504	−11.2	756,236	9,929	41,148
Oklahoma	7,349	10,100	30,321	−5.7	+11.9	27,221	89.8	354,241	−5.8	328,474	24,194	1,573
Region X:												
Louisiana	12,173	17,300	52,547	−10.0	−20.3	49,761	94.7	509,473	−8.2	487,489	14,479	6,580
New Mexico	1,539	2,100	6,494	−25.4	−30.8	6,158	94.8	60,204	−24.5	57,411	2,118	675
Texas	12,844	18,800	54,174	−9.0	−27.3	48,628	89.8	476,037	−9.0	444,176	31,067	488
Region XI:												
Arizona	920	1,300	3,867	−23.1	−36.1	3,673	95.0	45,096	−23.5	43,437	1,659	0
Colorado	2,159	3,400	9,604	+58.5	−54.8	8,933	93.0	101,674	+70.2	95,979	2,928	2,506
Idaho	1,226	1,500	4,818	−59.5	−49.7	4,470	92.8	55,799	−61.7	52,693	3,011	59
Montana	2,242	2,800	9,240	−46.1	−62.0	9,240	100.0	101,127	−48.6	101,127	(3)	(3)
Utah	1,203	1,400	4,815	−46.1	−11.2	4,436	92.1	67,616	−46.3	63,497	3,549	562
Wyoming	415	600	1,740	−46.9	−66.8	1,127	64.8	20,260	−51.8	14,875	1,441	3,944
Region XII:												
California	68,846	91,400	286,202	−16.2	−16.7	252,522	88.2	4,108,639	−17.1	3,765,971	173,692	160,865
Nevada	398	500	1,586	−43.8	−70.3	1,426	89.9	20,039	−45.8	18,651	837	551
Oregon	2,382	3,600	11,229	−35.1	−24.6	9,061	80.7	140,054	−36.8	120,118	11,696	6,649
Washington	3,087	4,600	13,292	−51.1	−66.0	10,685	80.4	152,813	−54.0	127,423	9,345	16,045
Territories:												
Alaska	308	400	1,444	−10.4	−47.9	1,382	95.7	19,356	−11.2	18,666	690	0
Hawaii	627	800	2,599	−30.0	−32.8	1,451	55.8	20,852	−27.9	15,875	129	4,848

[1] Not adjusted for voided benefit checks.
[2] Includes supplemental payments, not classified by type of unemployment.
[3] Benefits for partial and part-total unemployment are not provided by State law in Montana, New York, and Pennsylvania.
[4] Excludes Rhode Island; data not reported.

Chart 5.—*Number of waiting-period and compensable continued claims received, for weeks ended in January 1940–May 1942* [1]



[1] Comparable data not available prior to January 1940.

in several States, the number of initial claims declined 23 percent during May to a total of 583,000 (table 6).[7] Such claims, which are filed, for the most part, by persons newly or recently laid off, were 4.2 percent fewer [8] than last May and only three-fifths of the total in May 1940. May marks the third successive month in which initial claims have been fewer than in the same month of 1941.

Initial claims declined from the April level in every State except South Carolina and New York. The 46-percent increase in New York was primarily attributable to the advance filing of new-benefit-year claims prior to the start of the benefit year in June. Receipts were greater than last May in only 13 States, including Illinois, Indiana, Michigan, Missouri, South Carolina, and Wisconsin, where conversion unemployment or lay-offs from completed construction projects have been heavy. In Rhode Island, the increase over last year appears to have been due largely to displacements in the jewelry and textile industries. Compared with May 1940, receipts were fewer in every State except South Carolina.

[7] If New York is excluded from the totals, the April–May decline is 36 percent. A change in the beginning date of the benefit year in New York—from April 1 to the first Monday in June—resulted in a concentration of initial-claim receipts in May of this year instead of April.

[8] If New York is excluded, the decline is 12 percent.

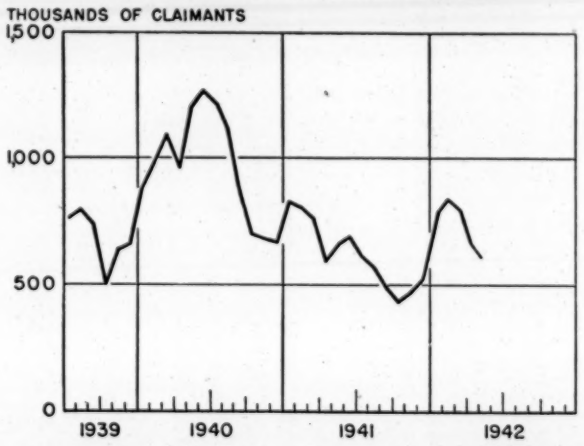
Most of the States reported declines in benefit payments from April to May (table 5). Increases occurred only in Kentucky and in 9 [9] of the 10 States with uniform benefit years beginning in April. The number of continued claims, on the other hand, rose only in Kentucky and in 5 of the 9 States mentioned above; in the other 4 States—Colorado, Maine, Maryland, and Rhode Island—they declined somewhat as the result of sharp reductions in waiting-period claims.

Unemployment occasioned by the shift of industry to a war footing continued to be evident in a number of States, including Illinois, Indiana, Kansas, Michigan, Missouri, Ohio, and Wisconsin, where payments were substantially greater than last May. The greater benefit outlay in most of the Southern States, as compared with last May, reflects the large number of workers separated from completed construction projects. Only five States —Kansas, Michigan, Missouri, Oklahoma, and Wisconsin—reported greater disbursements than in May 1940, but in each of them, except Michigan, both the number of checks issued and the number of continued claims filed were smaller than in May 1940. As in the previous month, more than half the benefit outlay for the country was concentrated in Illinois, New York, Michigan, and California.

The number of weeks compensated for total unemployment, declining for the second successive month, dropped 12 percent below the April total to 2.4 million. Weeks of compensated

[9] Colorado, Connecticut, Illinois, Maine, Maryland, Massachusetts, Rhode Island, Virginia, and West Virginia.

Chart 6.—*Average weekly number of claimants drawing benefits, by month, July 1939–May 1942* [1]



[1] Data for 1939 represent number of recipients during midweek of month.

partial unemployment dropped somewhat less sharply from the April level (9.8 percent to 116,000). This figure, however, was less than half the total in January 1942, while weeks of compensated total unemployment were only one-fourth fewer. In Hawaii and Wyoming, nevertheless, weeks of compensated partial unemployment constituted 43 and 27 percent, respec-

Table 6.—*Number of initial and continued claims received in local offices, by State, May 1942*

[Data reported by State agencies, corrected to June 19, 1942]

Social Security Board region and State	Initial claims				Continued claims				
	May 1942		January–May 1942		May 1942			January–May 1942	
	Number	Percentage change from April 1942	Number	Percentage change from January–May 1941	Number	Percentage change from— April 1942	Percentage change from— May 1941	Number	Percentage change from January–May 1941
Total	[1] 582,576	[1] −22.5	[1] 3,616,388	[1] −9.3	2,970,060	−15.4	−24.1	19,146,456	−8.4
Region I:									
Connecticut	7,156	−48.1	48,300	+10.3	30,035	+16.9	+52.2	161,747	−8.3
Maine	2,988	−58.8	22,319	−31.2	19,778	−15.1	−29.5	93,451	−36.3
Massachusetts	29,064	−39.2	150,902	−22.4	133,713	+4.6	−39.3	683,900	−31.2
New Hampshire	2,429	−2.1	13,630	+.3	12,005	−14.3	−28.1	63,614	−30.3
Rhode Island	7,906	−53.5	55,462	+8.4	64,065	−.1	+20.3	215,483	+10.0
Vermont	720	−5.8	5,389	−25.9	3,452	−30.5	−8.5	28,552	−41.5
Region II:									
New York	178,629	+45.5	642,874	−24.4	342,187	−24.4	−60.8	2,316,793	−34.0
Region III:									
Delaware	1,011	−16.9	9,276	−6.4	4,522	−37.5	−12.0	46,358	−1.8
New Jersey	30,046	−6.3	182,354	+8.4	121,503	−8.7	−16.1	906,396	+15.7
Pennsylvania	20,427	−7.7	143,018	−43.3	133,130	−22.5	−62.4	1,111,968	−43.3
Region IV:									
District of Columbia	873	−17.7	7,568	−36.6	8,604	−19.2	−50.4	65,675	−43.0
Maryland	4,419	−45.7	41,008	−9.6	47,355	−10.3	−29.5	211,998	−16.5
North Carolina	5,248	−24.2	51,556	−9.3	40,671	−16.9	−33.3	288,629	−12.3
Virginia	4,230	−72.6	27,703	−37.6	47,977	+54.3	−20.4	168,698	−21.1
West Virginia	4,384	−63.5	30,519	−72.0	33,898	+7.3	−38.8	145,273	−55.9
Region V:									
Kentucky	4,670	−59.3	42,685	−4.0	21,883	+7.4	−.9	112,073	+3.4
Michigan	31,157	−21.2	280,131	+118.4	275,025	−30.9	+236.2	2,007,316	+268.8
Ohio	14,803	−24.7	124,984	−11.6	134,371	−19.1	+3.1	984,003	+.4
Region VI:									
Illinois	76,691	−40.7	406,928	+6.2	357,315	+33.5	+18.7	1,340,288	+3.3
Indiana	10,084	−28.9	78,092	+85.6	83,983	−18.1	+104.4	626,489	+86.3
Wisconsin	[2] 5,490	−18.3	[2] 47,293	+3.4	34,086	−25.3	+65.0	300,842	+48.6
Region VII:									
Alabama	5,398	−7.2	34,655	−27.7	34,804	−8.4	−51.3	223,251	−27.3
Florida	6,444	−26.0	45,295	+2.1	47,235	−3.1	−8.4	267,892	+20.9
Georgia	5,056	−38.3	38,576	−11.1	54,779	−14.4	+13.5	351,478	+42.9
Mississippi	3,930	−30.2	30,323	+11.7	24,909	−19.6	−1.2	163,611	+13.8
South Carolina	5,704	+.2	31,803	+15.1	25,052	−13.7	+8.9	180,178	+35.1
Tennessee	6,884	−38.9	52,135	+14.8	72,873	−4.3	+1.5	430,432	+19.1
Region VIII:									
Iowa	3,922	−43.1	40,491	−4.9	26,078	−28.6	−16.0	223,444	−22.0
Minnesota	6,730	−38.8	69,475	−13.3	43,493	−42.2	−23.9	433,877	−21.8
Nebraska	1,237	−44.8	16,331	−5.4	7,713	−45.0	−32.5	97,660	−18.0
North Dakota	426	−48.9	5,727	−18.5	3,697	−47.0	−34.4	37,811	−27.0
South Dakota	318	−52.1	4,296	−18.3	3,623	−22.0	−35.5	24,762	−34.1
Region IX:									
Arkansas	1,797	−34.5	18,085	−45.9	10,211	−36.1	−77.9	87,922	−62.3
Kansas	3,190	−33.4	28,513	+8.0	20,714	−27.0	+6.3	160,213	+7.7
Missouri	9,851	−32.9	76,196	+20.3	87,275	−12.3	+22.6	518,016	+22.0
Oklahoma	4,064	−52.5	38,019	−9.2	35,320	−16.0	−5.3	193,116	−6.1
Region X:									
Louisiana	8,083	−41.0	60,936	+9.2	62,520	−19.7	−26.2	419,569	+9.7
New Mexico	717	−48.0	7,916	+4.9	7,144	−30.7	−37.2	53,219	−21.3
Texas	12,722	−29.1	93,802	−17.3	78,864	−16.5	−33.4	482,528	−18.8
Region XI:									
Arizona	1,144	−39.5	10,725	+5.0	4,537	−22.3	−45.6	34,573	−34.1
Colorado	1,393	−75.2	15,566	−26.8	11,914	−4.7	−55.7	74,585	−56.3
Idaho	751	−49.8	12,037	−22.2	5,018	−56.1	−59.3	78,067	−38.4
Montana	803	−43.8	10,980	−29.2	11,016	−42.6	−59.3	118,097	−41.8
Utah	655	−40.6	9,386	−9.7	4,727	−46.2	−24.4	62,194	−8.9
Wyoming	319	−45.8	5,109	−43.7	2,097	−46.7	−69.7	32,721	−32.5
Region XII:									
California	42,732	−36.3	348,972	−2.3	303,826	−23.7	−18.1	2,072,017	−11.7
Nevada	204	−49.6	3,258	−32.9	2,114	−38.5	−66.9	22,889	−56.3
Oregon	1,760	−37.0	32,285	−7.2	8,242	−49.7	−63.9	156,872	−29.5
Washington	3,797	−50.1	60,934	−38.2	15,620	−51.5	−68.1	237,932	−37.7
Territories:									
Alaska	(1)		[1] 402	[1] −65.9	2,166	−26.1	−45.6	14,442	−33.5
Hawaii	120	−67.2	2,169	−18.2	2,921	−27.7	−34.7	15,542	−16.8

[1] Excludes Alaska for May; data not reported.

[2] Excludes claims for partial unemployment.

tively, of all weeks compensated as compared with only 5.4 percent for the remaining States for which comparable data are available.

The declining rate at which workers are losing jobs was reflected in the smaller number of first payments issued during May to claimants beginning new benefit years. A 20-percent drop from April in the number of first payments was in contrast to the rather marked April–May increases of the 2 preceding years and brought the total for May down to 239,000,[10] about half the number in May 1941 and a third of that in May 1940.

Although the number of individuals who exhausted their rights to further compensation payments in their benefit year declined 13 percent from April to May, the drop was less marked than in 1941. The 114,000 [10] exhaustions reported during May were 13 percent more numerous than in May 1941, because of sharp rises in Michigan (from 3,000 to 15,100) and in New York (from 1,500 to 33,600). In New York the increase was due, in part at least, to the recent amendment extending the ending date of the uniform benefit year from March 31 to May 31, while the rise in Michigan is explained by the fact that workers who were thrown out of jobs earlier in the year because of the conversion of plants to war production are now exhausting their benefit rights.

Status of funds.—With the deposit of $144 million in State clearing accounts during May, collections received during the first 5 months of the year passed the half-billion dollar mark and totaled $549 million (table 7), or 20 percent more than the amount collected during the same period last year. Collections during April and May, however, which are based on covered pay rolls for the first

[10] Excludes Indiana and Wisconsin.

Table 7.—*Collections deposited in State clearing accounts, January–May 1942, and funds available for benefits as of May 31, 1942, by State*

[Data reported by State agencies, corrected to June 22, 1942]

Social Security Board region and State	Collections deposited [1] January–May 1942		Funds available for benefits [2] as of May 31, 1942
	Amount	Percentage change from January–May 1941	
Total	$548,775,630	[3] +19.9	$2,897,644,150
Region I:			
Connecticut	12,799,092	+6.1	76,088,988
Maine	3,275,672	+49.6	10,354,112
Massachusetts	20,524,234	−3.4	124,294,597
New Hampshire	2,541,777	+64.6	10,310,023
Rhode Island	7,866,216	+33.1	27,772,671
Vermont	949,779	+19.6	5,350,332
Region II:			
New York	83,355,587	+24.3	351,355,294
Region III:			
Delaware	1,026,784	−19.4	10,164,084
New Jersey	38,044,999	+36.7	210,873,035
Pennsylvania	56,583,632	+27.8	259,771,622
Region IV:			
District of Columbia	3,974,672	+37.7	28,104,241
Maryland	10,363,850	+38.1	42,172,907
North Carolina	8,078,444	[4]	40,287,593
Virginia	5,114,312	−.4	30,982,141
West Virginia	4,455,226	[4]	31,826,408
Region V:			
Kentucky	6,140,002	+7.0	45,924,028
Michigan	30,999,483	−1.0	125,932,556
Ohio	31,088,392	−5.0	250,460,476
Region VI:			
Illinois	46,443,266	+26.7	279,744,773
Indiana	14,335,352	+16.9	74,164,656
Wisconsin	4,217,136	[4]	71,053,806
Region VII:			
Alabama	6,992,588	+21.9	31,397,443
Florida	4,335,142	+3.0	17,060,630
Georgia	5,783,042	+22.1	35,003,792
Mississippi	2,105,708	+32.3	6,961,593
Region VII—Continued.			
South Carolina	$2,794,842	−3.2	$18,199,908
Tennessee	6,810,388	+36.7	24,615,300
Region VIII:			
Iowa	4,350,837	+11.2	26,259,966
Minnesota	6,081,471	+58.9	30,598,697
Nebraska	1,000,634	−3.0	10,580,149
North Dakota	414,383	[4]	2,546,545
South Dakota	322,810	−24.2	3,851,375
Region IX:			
Arkansas	2,822,661	+59.4	10,717,328
Kansas	2,693,796	+11.1	18,643,542
Missouri	13,908,496	+25.4	87,692,177
Oklahoma	3,182,760	+1.4	22,888,458
Region X:			
Louisiana	5,774,722	+20.1	23,728,587
New Mexico	752,701	+6.3	3,731,407
Texas	8,628,027	[4]	72,760,173
Region XI:			
Arizona	1,469,227	+30.7	5,975,627
Colorado	2,467,127	+2.7	15,191,698
Idaho	1,243,777	+21.8	4,061,751
Montana	1,543,956	+8.8	6,494,124
Utah	1,860,452	+29.5	6,796,106
Wyoming	647,756	+4.8	3,157,718
Region XII:			
California	52,003,971	+26.2	228,645,524
Nevada	806,567	+63.9	2,085,711
Oregon	4,668,737	+31.0	19,753,049
Washington	9,706,122	+62.9	39,218,789
Territories:			
Alaska	497,394	+80.0	2,224,898
Hawaii	927,629	−10.2	9,813,742

[1] Represents contributions from employers, plus such penalties and interest as are available for benefits, and contributions from employees. Adjusted for refunds of contributions and for dishonored contribution checks. Current contribution rates, as a percent of taxable wages, are as follows: For employers, 2.7 percent in all States except Michigan, where rate is 3.0 percent; for employees, 1.5 percent in Rhode Island, and 1.0 percent in Alabama, California, Kentucky, and New Jersey. Experience rating, resulting in modified contribution rates, became effective Jan. 1, 1938, in Wisconsin; Jan. 1, 1940, in Indiana, Nebraska, and South Dakota; Jan. 1, 1941, in California, Kansas, Kentucky, Minnesota, New Hampshire, Texas, Vermont, Virginia, and West Virginia; Apr. 1, 1941, in Alabama, Connecticut, and Hawaii; July 1, 1941, in Oregon; Jan. 1, 1942, in Arizona, Colorado, Delaware, Florida, Georgia, Iowa, Massachusetts, Michigan, Missouri, New Jersey, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, and Wyoming; and Apr. 1, 1942, in Arkansas. All States collect contributions either wholly or in part on quarterly basis.

[2] Represents sum of balances at end of month in State clearing account and benefit-payment account, and in State unemployment trust fund account maintained in the U. S. Treasury. State unemployment trust fund accounts reflect transfers to railroad unemployment insurance account.

[3] Based on data for 46 States. See footnote 4.

[4] Not computed, because contributions for the 2 periods compared relate to wages paid during different numbers of months.

quarter of 1942, were only 14 percent more than last year, reflecting, in part, the operation of experience rating in 16 additional States, effective January 1, 1942. Despite the reduction of contribution rates under experience rating, however, indications are that the sharply expanded volume of covered employment, steadier employment, longer workweeks, and higher wage rates will undoubtedly cause collections for the year to surpass the $1 billion total of 1941. Funds available for benefit payments continued their steady rise, reaching $2.9 billion at the end of the month. Reserves are now 37 percent greater than at the end of May 1941.

Estimating the Potential Expansion of the Female Labor Force in Urban Areas*

The expansion of war employment and the appearance of general labor shortages in important war industry centers have raised the question of the extent to which women can be drawn into war employment. Elsewhere in this issue there is a discussion of the utilization of women for war work [1] as well as an article on the potential expansion of the labor force.[2] Both articles deal with the national aspects of the problem. It is often important, however, to know the number of women who might be drawn into the labor force in a specific war industry center. This information may be needed to determine the extent to which the area can absorb further war contracts, the degree to which in-migration can be prevented if women workers are available locally, or, roughly, the number of day nurseries necessary to care for children of working mothers. For these reasons a method is needed for quickly estimating the number of women who may be expected to enter the labor market in a given local area in response to expanded labor demands. The following procedure is adaptable for meeting these needs.

The 1940 census of population indicates that in April 1940 in urban areas 31 percent of all women 14 years of age and over were in the labor force, in contrast to 21 percent in the rural-nonfarm and 12 percent in the rural-farm areas. In cities of 1 million or more population, female work rates were somewhat higher, reaching a high of 34 percent in New York City. There were, however, a number of cities of 100,000 or more in which the proportion of women in the labor force was far in excess of the national urban average or of those for cities of 1 million or more. Washington, D. C., for example, had 45 percent of its women 14 years of age and over in the labor force in 1940; Fall River, Massachusetts, had 43 percent; and Richmond, Virginia, 42 percent. The accompanying table lists the proportion of women in the labor force at the time of the 1940 census for 11 cities which had an unusually high proportion of the female population in the labor force. The proportions in each age group are also shown, and it can be seen that in these cities considerably higher female work rates prevailed in each age group than for all urban areas combined.

Two types of cities are represented in this group of cities with high female work rates—New England communities, in which textiles, apparel, and other consumer-goods industries offer extensive employment opportunities for women, and Southern cities in which domestic and personal service, tobacco manufacturing, and textile industries offer employment opportunities for both Negro and white women.

By 1943 it may be expected that job opportunities for women in most war production centers will be as plentiful as they were in 1940 in the 11 cities. Under these circumstances it is not unreasonable to expect that women can be drawn into the labor force to at least as great a degree as that achieved in these areas in 1940 if, in a given urban area, a general male labor shortage prevails; if the principal industries in the area are those with occupations suitable for women; and if there is full employer willingness to utilize women. Larger numbers of women will be drawn into industry if, as is already being done in many areas, day nurseries are established to enable mothers to accept gainful employment.

As indicated in the article on the labor-force

*Prepared by Clarence M. Weiner, Reports and Analysis Division, Bureau of Employment Security.

[1] See "Employment of Women in War Production."

[2] See "Labor-Force Reserves."

reserves, it would be more valid to consider the marital and parental status of women in each area, in order to determine whether it is possible to achieve high rates of labor utilization. Since such data for urban areas are not readily available, the present procedure is based on potential work rates for specific age groups, thereby taking into some consideration the fact that the marital and parental status of women is highly correlated with age.

An estimated potential work rate was determined for each specific age group by examining the corresponding proportions in each of the high-work-rate cities. For example, in the group aged 14–19 years, the two highest ratios in any of the cities were 43.6 percent for Fall River and 36.0 percent for New Bedford, Mass.; the next two were 33.3 and 33.1 percent, respectively, for Providence, R. I., and Bridgeport, Conn. It was therefore assumed that in most urban centers of expanded demand where women can be drawn into industry it would not be impossible to achieve a proportion of 35 percent of women in the labor force in this age group. Similarly, for each of the other age groups, potential work rates were determined.

The estimated potential work rates for each age group are shown in the last line of the accompanying table.[1] No rate is shown for all women 14 years of age and over, because this rate will depend on the age distribution in a given area. In most urban areas the work rate is estimated at about 44 to 47 percent of the women 14 years of age and over. In some areas, particularly where employment opportunities for women are exceptionally favorable—as in certain munitions producing centers—the proportions in some of the age groups may very well exceed the estimated potential rates.

The application of these potential work rates to the female population of a given area, by age groups, yields an estimate of the total number of women who might be expected to be in the labor force at a time when the peak of employment is reached in the area. By subtracting the number of women already in the labor force in 1940, it is possible to estimate the net increment between 1940 and the date of the estimated peak. This estimate has to be adjusted for migration, natural increase, and the aging of the population during the period between April 1940 and the date of the peak. These adjustments have to be made on the basis of local information.

Table 1.—*Percent of women in each age group in the labor force, April 1940*

Area	Total 14 years and over	14–19 years	20–24 years	25–44 years	45–64 years	65 years and over
All areas	25.5	18.8	45.4	30.3	19.7	5.7
Urban	31.2	23.2	55.4	37.1	23.5	6.1
Rural-nonfarm	20.6	15.8	35.4	23.8	17.7	4.6
Rural-farm	12.1	12.3	24.0	13.2	9.8	5.5
Cities of 1 million or more	33.0	26.8	62.9	37.9	22.6	6.0
New York	33.9	28.5	68.0	38.5	21.5	5.6
Chicago	33.5	27.8	63.6	38.6	22.1	5.6
Philadelphia	33.1	27.6	62.2	38.5	23.8	7.0
Detroit	28.2	25.2	52.1	30.3	18.6	5.4
Los Angeles	32.2	15.9	48.0	40.6	30.0	6.9
High-work-rate cities of 100,000 or more:						
Washington, D. C.	45.3	20.6	61.1	56.5	39.6	10.4
Fall River, Mass.	43.1	43.6	77.4	53.8	27.0	4.8
Richmond, Va.	42.3	26.4	63.3	52.8	32.1	9.3
Atlanta, Ga.	42.2	25.7	56.3	51.6	33.8	8.8
New Bedford, Mass.	40.5	36.0	75.2	52.3	27.6	4.7
Dallas, Tex.	39.3	24.1	52.9	48.0	31.8	6.7
Tampa, Fla.	40.4	19.4	53.3	52.1	34.7	9.0
Nashville, Tenn.	36.9	20.5	51.0	46.9	30.7	8.8
Miami, Fla.	38.5	23.8	55.1	47.8	29.2	8.2
Providence, R. I.	37.1	33.3	70.6	43.2	27.6	8.6
Bridgeport, Conn.	37.2	33.1	69.4	43.6	24.2	6.9
Estimated potential work rates (preliminary)	------	35.0	70.0	53.0	33.0	8.5

Until information on the marital and parental status of women in given areas is available, the procedure described above should provide a rapid method of estimating the potential increase. Its usefulness is enhanced by the fact that the necessary data for its application are available for all cities of 100,000 or more in Bureau of the Census releases and bulletins. Age distributions of the female population appear in the second series, population bulletins, which have been issued for each State. Age distributions of the female labor force for States and cities of 100,000 or more appear in a series of releases based on the third series, population bulletins, which are now being issued for each State.

In applying this procedure, it must be clearly understood that the following assumptions underlie the method: that there is a general male labor shortage in the area which causes employers to hire women insofar as possible; that the industries of the area are of a nature which permits the employment of women in occupations suitable for them; and that extensive provisions will be necessary for the care of children of working mothers.

[1] The estimated potential work rates shown in the accompanying table are preliminary. By September 1942 the Bureau of the Census will have published labor-force data for most cities of 100,000 or over in greater detail than are at present available. Potential work rates for these more detailed age groups will be presented in an early issue of the Bulletin.

Contribution Rates For Minnesota Employers, 1941 and 1942*

An analysis has been made of changes in the 1941 and 1942 contribution rates of 26,987 Minnesota employers to whom the experience-rating provisions of the State law have applied in both years. The formula for rate modification was the same in both years, but 1942 rates were based on employers' experience during the period July 1938–June 1941, while 1941 rates had been based on experience during the period 1938–40. Employers were assigned 1 of 13 contribution rates ranging from 0.5 to 3.25 percent. The total pay roll in the State is equally distributed among the 13 rates, except that the pay roll taxed at the 3.25 percent rate is twice that at any other. Since these matched accounts represent nearly all employers in the State, the relationships found for them may be assumed to prevail for all Minnesota employers.

The number of employers who received the minimum and maximum rates increased in 1942, while all the intermediate rates, especially the 1.75-percent rate, showed a lower number of accounts than in 1941. A small number of employers with very large pay rolls moved into the 1.75-percent class, while a comparatively large number of small firms moved out of this group.

More than 90 percent of the accounts receiving either the 0.5 or the 3.25-percent rate in 1941 were subject to the same rate in 1942 (table 1). The rates of employers at the extremes could, of course, be modified in only one direction, while all others could move either up or down. Employers with small pay rolls were concentrated in the lowest or the highest classes, since they were most likely to have had either no charges against their accounts or a great many in relation to pay roll. While large firms in Minnesota had a tendency not to receive either the minimum or the maximum rate, small firms in industries such as construction were doubly exposed to a high contribution rate because of the inherent irregularity of their operations. Although about 70 percent of all accounts retained their 1941 rates the following year, only about 7 percent of the 1.75-percent and 2.75-percent groups and 9 percent of the 2.5-percent group remained unchanged. In all three groups the percentage with higher rates in 1942 was far above the average for all accounts.

Rate stability varied greatly for different size-of-pay-roll groups. An almost perfect inverse correlation existed between the size of the firm's pay roll and its retention of the 1941 rate in 1942; only 26 percent of the firms with pay rolls of $1 million or more obtained the same rate in 1942, compared with 77 percent of the under-$3,000 group. The fact that small employers tend to have the extreme rates and large employers the intermediate rates may explain these variations in rate stability.

Table 1.—*Comparison of contribution rates received by identical Minnesota employers, 1941 and 1942*

1941 rate	Number of employers with specified rate in 1941	Percent with same rate in 1942	Percent with higher rate in 1942	Percent with lower rate in 1942
All accounts	26,987	70.1	20.5	9.4
All unrated accounts [1]	8,029	88.1	5.3	6.6
All rated accounts	18,958	62.5	26.9	10.6
0.5	6,502	91.0	9.0	
.75	935	46.8	33.9	19.3
1.0	697	30.6	46.9	22.5
1.25	490	17.6	58.0	24.5
1.5	572	18.7	56.8	24.5
1.75	707	7.2	66.8	26.0
2.0	627	12.0	65.1	23.0
2.25	582	10.5	62.9	26.6
2.5	550	8.9	70.9	20.2
2.75	1,034	7.4	74.2	18.5
3.0	1,376	21.8	62.3	15.8
3.25	4,886	91.7		8.3

[1] Represents all employers not eligible for rate modification. Such employers are the only ones subject to the 2.7 rate.

Stability of rates during the 2 years was greatest among firms in the construction and miscellaneous industries, while increased rates occurred most frequently in transportation, trade, and manufacturing. Lower rates were obtained by a larger proportion of employers in manufacturing, trans-

The relationship of the modified rates to industry groups was also analyzed. The average rate for all firms (with no weighting for size of pay roll) was 1.74 percent, but this rate was considerably lower than the average for construction and manufacturing employers. As in most other States, lower-than-average rates were found in service, finance, and trade.

*Summarized from a study by the Research and Statistics Unit, Minnesota Division of Employment and Security.

portation, and trade than in the remaining industry divisions. The data suggest that the instability of rates for given industry groups results in modification of rates in both directions, although the general tendency was toward higher rates in 1942. The greatest instability of rates occurred among the industry divisions with intermediate contribution rates in 1941, since the employers with either of the extreme rates were likely to maintain them from year to year.

Railroad Unemployment Insurance *

A widespread impression exists that each additional person put to work means one less recipient of unemployment insurance. However, the steady rise of employment on railroads in recent months has not resulted in an equivalent decline in claims for unemployment insurance. According to the Interstate Commerce Commission, employment increased by 102,000 from February to May, but claims for unemployment insurance filed by railroad workers declined in the same period by only 53,300. Furthermore, since two claims must be filed to cover 1 month of unemployment, the decline in claims would have covered 26,650 man-months of unemployment at most. On the basis of a 12-month comparison, the differences are even greater. The increase in employment in the year ending May 1942 was 145,000, while the number of claims decreased only 31,400, which would have covered not more than 15,700 man-months.

There are a number of reasons why unemployment insurance claims do not decline as rapidly as employment rises. The primary reason may be summed up as irregularity of employment with respect to both time and place. The irregularity which brings about the greatest number of claims for unemployment insurance is that resulting from the drop in maintenance-of-way work because of winter weather. Also contributing to irregularity of employment are the influences of the seasons on railroad traffic affecting such items as iron ore, coal, and agricultural products; pre-Christmas freight; and passenger traffic. Other factors affecting the relationship between reemployment and unemployment insurance claims include the influx of new workers who had not been previously employed in the railroad industry and employment in other industries of workers laid off by railroads.

Employment on class I steam railroads increased 30,000 from mid-April to mid-May. The increase was somewhat greater than that which usually occurs at this season. Three-fourths of it was accounted for by maintenance-of-way employees. The additional employees engaged in maintenance

*Prepared by the Office of Director of Research, Railroad Retirement Board, in collaboration with the Bureau of Research and Statistics, Social Security Board.

Table 1.—*Railroad unemployment insurance: Applications for certificate of benefit rights, claims received, and benefit payments certified, by specified period, 1941–42 and 1940–41*

Period	1941–42				1940–41			
	Applications	Claims	Benefit payments		Applications	Claims	Benefit payments	
			Number	Amount			Number	Amount
July–May	88,819	507,053	[1] 439,648	[1] $8,701,139	178,778	1,226,622	[1] 974,090	[1] $17,222,181
May	1,126	17,363	14,717	296,621	2,141	48,724	40,420	740,346
1st week	279	5,410	4,665	92,933	697	15,610	13,084	249,178
2d week	248	4,557	3,862	75,782	579	14,106	11,930	215,650
3d week	318	4,045	3,324	69,805	497	11,239	8,834	156,883
4th week	281	3,351	2,866	58,101	368	7,769	6,572	118,635
Weekly averages:								
July	3,838	6,464	4,683	83,843	8,788	22,950	11,092	159,643
August	1,315	7,499	6,175	129,947	4,138	24,240	15,240	222,651
September	986	7,220	6,413	140,457	2,809	22,721	16,584	247,928
October	1,194	7,378	6,391	138,776	2,813	19,596	14,190	210,388
November	2,659	8,760	7,280	152,363	7,622	23,298	11,483	173,494
December	4,594	13,267	11,180	[2] 204,195	6,157	34,401	30,037	556,150
January	2,956	19,206	17,147	325,842	2,885	39,753	39,362	754,649
February	1,154	17,661	16,406	[2] 332,201	1,464	33,325	31,448	614,284
March	636	15,721	14,550	293,933	931	29,255	27,760	539,420
April	357	9,975	8,812	165,664	1,851	20,558	18,089	329,462
May	282	4,341	3,679	74,155	535	12,181	10,105	185,037

[1] Net figures, corrected for underpayments and recovery of overpayments.

[2] Revised.

of equipment and stores, train-and-engine service, and professional and clerical work also numbered in the thousands. Although the rise in employment was Nation-wide, the greatest proportional rises occurred in New England and the northern tier of States west of the Great Lakes. It was in those regions that the greatest relative increases took place in maintenance-of-way employees. Employment in train-and-engine service gained more than in maintenance of way in the States south of the Ohio River and east of the Mississippi.

Claims for unemployment compensation.—Railroad workers filed only 17,400 claims for unemployment insurance in May (table 1). The number of claims processed was 18,700. Some 1,050 were adjudicated a second time, mainly because the claimant had been previously disqualified through failure to submit the required proof of availability for work. About 14,700, or 79 percent of the claims processed, were certified for payment. Only 6.1 percent of the payments were made to workers who had not previously received railroad unemployment compensation in the benefit year ending June 30, 1942.

Unemployment benefits.—Benefits certified during the 5 weeks of April amounted to $828,000; in the 4 weeks of May, only $297,000. Yet the average sum paid to workers receiving their initial benefits in May was $16.88, the highest during the current benefit year, and the average benefit paid on subsequent claims was $20.38. The decline in the total amount of benefits paid, accompanied by a significant increase in the average daily benefit rate, reflected the fact that unemployment benefits had ceased for tens of thousands of low-paid track laborers who had returned to work.

The average benefit for workers registering unemployment for the first time since last June increased from $16.33 in April to $16.88 in May (table 2). The highest average, $19.02, recorded in the Rocky Mountain area, represented an increase of $2.22 from the average for April and $4.27 from the average for the present benefit year. The next highest average for May—$18.27—was for the New England and Central Atlantic States. That represented a considerable increase over the average of $14.89 so far this year for this district. The lowest average for benefits was paid in the Dakotas and Minnesota area, where they averaged $14.84.

Although the average benefit for workers who had previously received unemployment compen-

Table 2.—*Railroad unemployment insurance: Number of benefit certifications, average benefit, and average number of compensable days in benefit year 1941–42, by specified period, July 1941–May 1942* [1]

Type of certification and period	All certifications				Certifications with 14 days of unemployment			Certifications with 8–13 days of unemployment				Certifications with 5–7 days of unemployment			
	Number	Average benefit payment	Average daily benefit	Average number of compensable days	Percent of all certifications	Average benefit payment	Average daily benefit	Percent of all certifications	Average benefit payment	Average daily benefit	Average number of compensable days	Percent of all certifications	Average benefit payment	Average daily benefit	Average number of compensable days
Certifications for first registration period: [2]															
July 19–Aug. 1, 1941	8,989	$15.94	$2.64	6.03	68.7	$18.48	$2.64	31.3	$10.34	$2.65	3.90	----	----	----	----
Aug. 2–29	5,877	14.24	2.55	5.57	60.4	17.92	2.56	39.6	8.65	2.53	3.42	----	----	----	----
Aug. 30–Sept. 26	[3] 3,465	14.45	2.58	5.60	58.3	17.99	2.57	41.7	9.50	2.61	3.64	----	----	----	----
Sept. 27–Oct. 31	4,149	14.48	2.54	5.69	61.9	17.92	2.56	38.1	8.91	2.51	3.55	----	----	----	----
Nov. 1–28	5,042	13.90	2.35	5.93	67.4	16.40	2.34	32.6	8.73	2.36	3.70	----	----	----	----
Nov. 29, 1941–Jan. 2, 1942	16,488	14.39	2.35	6.13	72.5	16.36	2.34	27.5	9.22	2.40	3.84	----	----	----	----
Jan. 3–30	15,512	14.06	2.57	5.47	61.3	17.57	2.51	38.7	8.51	2.79	3.05	----	----	----	----
Jan. 31–Feb. 27	[3] 6,183	14.56	2.51	5.80	63.1	17.36	2.48	36.9	9.78	2.62	3.74	----	----	----	----
Feb. 28–Mar. 27	3,016	15.29	2.68	5.71	61.2	18.90	2.70	38.8	9.57	2.60	3.68	----	----	----	----
Mar. 28–May 1	2,048	16.33	2.82	5.79	60.6	19.81	2.83	39.4	10.94	2.79	3.92	----	----	----	----
May 2–29	900	16.88	2.92	5.78	67.6	20.27	2.90	32.4	9.82	3.03	3.24	----	----	----	----
Certifications for subsequent registration periods: [2]															
July 19–Aug. 1, 1941	1,421	22.55	2.44	9.26	80.7	24.50	2.45	15.4	16.47	2.32	7.10	3.9	$5.15	$2.32	2.22
Aug. 2–29	18,156	23.36	2.66	8.79	71.8	26.90	2.69	22.0	17.18	2.53	6.79	6.2	4.93	2.50	1.99
Aug. 30–Sept. 26	21,671	22.91	2.64	8.66	69.6	26.77	2.68	22.9	16.82	2.52	6.69	7.5	5.08	2.49	2.04
Sept. 27–Oct. 31	27,617	22.82	2.64	8.63	67.6	26.85	2.68	25.2	17.23	2.53	6.81	7.2	5.13	2.55	2.01
Nov. 1–28	23,941	22.44	2.60	8.63	68.3	26.19	2.62	24.5	16.98	2.52	6.73	7.2	5.46	2.55	2.14
Nov. 29, 1941–Jan. 2, 1942	39,335	19.89	2.42	8.26	62.5	23.80	2.38	26.3	16.36	2.46	6.65	11.2	6.32	2.69	2.35
Jan. 3–30	52,982	20.45	2.35	8.70	69.7	23.37	2.34	23.5	16.13	2.39	6.74	6.8	5.35	2.54	2.11
Jan. 31–Feb. 27	59,326	20.84	2.36	8.84	71.6	23.48	2.35	22.5	16.50	2.40	6.89	5.9	5.21	2.49	2.09
Feb. 28–Mar. 27	55,125	20.47	2.37	8.64	68.4	23.60	2.36	24.1	16.37	2.39	6.85	7.5	5.14	2.46	2.09
Mar. 28–May 1	41,877	18.89	2.41	7.84	55.7	24.23	2.42	30.3	15.56	2.41	6.47	14.0	5.21	2.38	2.19
May 2–29	13,800	20.38	2.66	7.66	51.9	27.35	2.74	33.0	16.18	2.50	6.47	15.1	5.59	2.54	2.21

[1] Data based on 33.3-percent sample, except number of certifications and average benefit per certification.

[2] Benefits are payable for each day of unemployment in excess of 7 for first registration period and in excess of 4 for subsequent registration periods.

[3] Revised.

sation increased from $18.89 in April to $20.38 in May, it was nevertheless smaller than the average paid out thus far in the current benefit year. The regional differences in these averages were more marked than were those for workers receiving their first benefit payments. The lowest average payment was $16.63; the highest, $25.51. As in the case of the average of initial payments, the payments for subsequent periods of unemployment averaged lowest in the Dakotas and Minnesota area. The highest average payment for subsequent periods occurred in the California area.

Unemployment insurance accounts were opened for 916 railroad workers during May, while 1,135 workers exhausted their benefits for the fiscal year. The number of accounts current as of May 29 was 63,307.

Applications for certificate of benefit rights.—Most of the workers who filed claims for unemployment insurance during the month had been unemployed previously in this benefit year. Those who were unemployed for the first time or who had not requested benefits were required to make applications for certificate of benefit rights. Only 1,100 applications were made in May. The return of spring tends to reduce the number of applications received by the Board. Warmer weather permits the resumption of repair work on buildings, bridges, and roadbeds. Moreover, railroad traffic had increased so much this spring that reemployment in maintenance of way and structures has been greater than for some years past.

The fact that nearly 88,000 workers had previously filed applications also contributed to the low level of applications in May. In May of last year the number of applications declined to 7.0 percent of the number in the highest winter month of 1940–41; the comparable figure for this year is 4.9 percent. A further decline is expected in June. Certificates of benefit rights issued in May numbered 30 less than applications. By the end of May, 86,443 employees had received certificates for the current benefit year; 1,846 applications were denied mainly because total 1940 wages were less than $150.

Employment service.—Placement operations increased substantially during May, and 13,398 openings were reported. Of these, more than 95 percent were with railroad employers. At the same time, 4,403 previously reported openings were canceled in May primarily because qualified personnel were not available.

During the month, 15,635 workers were referred to employers, and 8,802 were placed. The average number of placements per week was 2,200, compared with 1,700 in April. About 450 workers received temporary jobs which were expected to last less than a month. The U. S. Employment Service and the WPA Division of Reemployment and Training cooperated in 1,688 placements.

The placements made were largely in seasonal occupations. The majority of the reemployed workers were track laborers placed from the rolls of the Kansas City, Dallas, and Chicago offices of the Railroad Retirement Board. About three-fourths of the placements were track laborers. In addition, jobs were obtained for 1,046 other laborers, 172 clerical workers, 105 brakemen and switchmen, 437 baggage and freight handlers, and 153 maintenance-of-equipment workers.

OLD-AGE AND SURVIVORS INSURANCE

BUREAU OF OLD-AGE AND SURVIVORS INSURANCE • ANALYSIS DIVISION

Operations Under the Social Security Act

Monthly Benefits in Force and Payments Certified, May 1942

The continuing excess of awards over terminations for all types of benefits brought the total number in force at the end of May to 579,000 (table 1), an increase of 17,900 over those in force at the end of April. The total amount of benefits in force rose to $10.5 million.

More than one-fifth of the increase in the number in force was accounted for by the increase in benefits in conditional-payment status. For the first time since the beginning of the old-age and survivors insurance program, more than 10 percent of all benefits in force were in conditional-payment status.

The 3,800 additional suspensions were almost entirely responsible for the increase in the number in conditional-payment status. Frozen benefits, the other subdivision of benefits in conditional-payment status, continued to remain relatively constant as an absolute number and to decline as a proportion of all benefits in force. Wage earners file claims to freeze their benefits because they expect to receive or are already receiving wages lower than their previous average wage. Since the great majority of benefits in frozen status are primary and wife's benefits, it is to be expected that the proportion of benefits in this status would decrease as wage rates rise. Suspensions, on the other hand, increase as a proportion of the whole when opportunities for employment are increasing, because most suspensions result from the employment of either the beneficiary or the primary beneficiary on whose wages the claim is based.

The number of benefits in deferred-payment status continued to decrease as a proportion of all benefits in force and during May also decreased slightly as an absolute figure. Deferred

Table 1.—*Number and amount of monthly benefits in force [1] in each payment status [2] and actions effected during the month, by type of benefit, May 1942*

[Current month's data corrected to June 24, 1942]

Status of benefit and action	Total		Primary		Wife's		Child's		Widow's		Widow's current		Parent's	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
In force as of Apr. 30, 1942	561,510	$10,205,256	263,649	$6,006,238	73,552	$892,134	145,662	$1,774,041	19,636	$396,911	56,686	$1,105,713	2,325	$30,219
Current-payment status	502,519	9,059,043	227,580	5,189,254	65,586	797,403	138,639	1,693,606	19,405	391,674	48,994	957,010	2,315	30,096
Deferred-payment status	4,415	84,377	3,110	66,674	626	7,073	321	3,692	112	2,617	242	4,276	4	45
Conditional-payment status	54,576	1,061,836	32,959	750,310	7,340	87,658	6,702	76,743	119	2,620	7,450	144,427	6	78
Suspensions [3]	40,256	749,892	24,326	524,747	5,153	58,283	5,412	61,387	70	1,486	5,289	103,911	6	78
Frozen benefits [4]	14,320	311,944	8,633	225,563	2,187	29,375	1,290	15,356	49	1,134	2,161	40,516	0	0
Actions during May 1942:														
Benefits awarded	21,869	396,190	8,858	209,324	2,852	35,357	6,322	77,156	1,151	22,911	2,580	50,056	106	1,386
Entitlements terminated [5]	3,932	70,318	1,437	33,963	697	8,586	1,105	14,172	68	1,380	609	11,979	16	238
Net adjustments [6]	1	1,231	7	495	−1	44	−6	404	−1	−3	2	287	0	4
In force as of May 31, 1942	579,448	10,532,359	271,077	6,182,094	75,706	918,949	150,873	1,837,429	20,718	418,439	58,659	1,144,077	2,415	31,371
Current-payment status	516,478	9,313,329	232,746	5,316,160	67,129	817,565	143,305	1,750,619	20,489	413,195	50,406	984,569	2,403	31,221
Deferred-payment status	4,309	82,445	2,980	64,527	608	6,834	358	4,021	109	2,570	250	4,448	4	45
Conditional-payment status	58,661	1,136,585	35,351	801,407	7,969	94,550	7,210	82,789	120	2,674	8,003	155,060	8	105
Suspensions [3]	44,105	818,926	26,668	573,501	5,758	64,792	5,872	66,699	67	1,479	5,732	112,350	8	105
Frozen benefits [4]	14,556	317,659	8,683	227,906	2,211	29,758	1,338	16,090	53	1,195	2,271	42,710	0	0

[1] Represents total benefits awarded after adjustment for subsequent changes in number and amount of benefits (see footnote 6) and terminations (see footnote 5), cumulative from January 1940, when monthly benefits were first payable.

[2] Benefit in current-payment status is subject to no deduction from current month's benefit or only to deduction of fixed amount which is less than current month's benefit; benefit in deferred-payment status is subject to deduction of fixed amount which equals or exceeds current month's benefit; benefit in conditional-payment status is subject to deduction of entire benefit for current and each subsequent month for indefinite period.

[3] Represents benefits which have previously been in current or deferred-payment status.

[4] Represents benefits which have never been in current or deferred-payment status.

[5] Terminations may be for following reasons: primary benefit—beneficiary's death; wife's benefit—beneficiary's death, death of husband, divorce, or entitlement of beneficiary to equal or larger primary benefit; child's benefit—beneficiary's death, marriage, adoption, or attainment of age 18; widow's benefit—beneficiary's death, remarriage, or entitlement to equal or larger primary benefit; widow's current benefit—beneficiary's death, remarriage, entitlement to widow's benefit or to equal or larger primary benefit, or termination of entitlement of last entitled child; parent's benefit—beneficiary's death, marriage, or entitlement to other equal or larger monthly benefit.

[6] Adjustments in amount of monthly benefit may result from entitlement of an additional beneficiary or termination of entitlement of an existing beneficiary when maximum provisions of sec. 203 (a) of the 1939 amendments are effective or from termination of entitlement of an existing beneficiary when minimum provision of sec. 203 (b) consequently becomes effective; adjustments in number or amount may also result from actions not otherwise classified.

Table 2.—*Average amount of monthly benefits in force, by type of benefit and payment status, May 31, 1942* [1]

[Corrected to June 24, 1942]

Type of benefit	Total in force	Payment status			
		Current	Deferred	Conditional	
				Suspensions	Frozen benefits
Primary	$22.81	$22.84	$21.65	$21.51	$26.25
Wife's	12.14	12.18	11.24	11.25	13.46
Child's	12.18	12.22	11.23	11.36	12.03
Widow's	20.20	20.17	23.58	22.07	22.55
Widow's current	19.50	19.53	17.79	19.60	18.81
Parent's	12.99	12.99	11.25	13.12	0

[1] See footnotes to table 1.

benefits result primarily from deductions due to lump-sum payments made under the 1935 act and from deductions of the amount of payment made for months when deductions should have been made. The number of deductions resulting from lump-sum payments will continue to decrease. Improved interviewing techniques and other administrative safeguards should also reduce the relative number of payments made because a beneficiary failed to report a circumstance which would cause a deduction.

The average amount of monthly benefits in force (table 2) usually shows little change from month to month. There were slight increases during May in the average amounts of primary and wife's benefits in force; other types either remained the same or decreased slightly.

During May the annual rate of certifications rose to nearly $120 million. More than half the amount certified was for primary benefits (table 3). Certifications for all types of survivors' benefits accounted for one-third of the total amount and two-fifths of the number certified.

Table 3.—*Monthly benefits and lump-sum death payments certified, by type of payment, May 1942 and cumulative, January–May 1942*

Type of payment	May				Total amount certified January–May 1942
	Number of beneficiaries [1]	Amount certified	Percentage distribution		
			Beneficiaries	Amount	
Monthly benefits [2]	524,693	[3]$9,856,306	100.0	100.0	[3]$46,587,910
Primary	238,044	5,569,667	45.4	56.5	26,469,354
Supplementary	78,757	974,054	15.0	9.9	4,632,004
Wife's	68,549	861,356	13.1	8.8	4,082,075
Child's	10,208	112,698	1.9	1.1	549,929
Survivor's	207,892	3,312,585	39.6	33.6	15,486,552
Widow's	20,201	437,814	3.8	4.4	1,974,802
Widow's current	51,173	1,082,800	9.7	11.0	5,131,592
Child's	134,139	1,757,115	25.6	17.8	8,217,919
Parent's	2,379	34,856	.5	.4	162,239
Lump-sum death payments	[4] 9,003	1,238,814			6,378,769
Under 1939 amendments [5]	8,833	1,231,145			6,335,348
Under 1935 act [6]	170	7,669			43,421

[1] Differs from number in current-payment status, which takes account of changes in status effective after certification.
[2] Distribution by type of benefit estimated. Estimates revised February 1942.
[3] Includes retroactive payments.
[4] Represents number of deceased workers on whose wages payments were based.
[5] Payable with respect to workers who died after Dec. 31, 1939, in cases in which no survivor could be entitled to monthly benefits for month in which worker died.
[6] Payable with respect to workers who died prior to Jan. 1, 1940.

Applicants for Account Numbers, First Quarter, 1942

During the first quarter of 1942, more than 1.2 million employee accounts were established (table 4), 9.3 percent less than during the corresponding quarter of last year and 13.7 percent less than during the fourth quarter of 1941. Accounts established by the end of March 1942 totaled 61.7 million. It is estimated that, after adjustments are made for deaths and persons with more than one account number, 57.6 million individuals 14 years of age and over held account numbers at the end of March 1942.

Account-number holders have formed an increasingly large part of the population. As of January 1, 1941, they constituted 49.1 percent of the total number of persons aged 14 years and over as estimated on the basis af census data; a year later, 54.4 percent; and on March 31, 1942, 55.4 percent. The proportion of account-number holders is, of course, much higher in relation to the population 20 and over, or to the population

Table 4.—*Total applicants for account numbers in 1940, 1941, and first quarter 1942, and estimated number of account-number holders at end of each period*

Period	Applicants for account numbers		Estimated number of account-number holders 14 years and over as of end of period [1]	
	Total during period	Cumulative total as of end of period	Number	Percent of estimated total population 14 years and over [2]
1940	5,181,709	53,790,199	50,400,000	49.1
1941	[3] 6,677,584	60,467,783	56,500,000	54.4
January–March 1942	1,215,917	61,683,700	57,600,000	55.4

[1] Estimated by adjusting the cumulative total of accounts established for duplications as well as for death; includes Alaska and Hawaii.
[2] Population 14 years of age and over estimated on basis of census data; includes Alaska and Hawaii.
[3] Excludes 317 applicants whose sex and/or race are unknown.

Table 5.—*Distribution of applicants for account numbers by sex, race, and age group, by quarter, January 1940–March 1942*

Year and quarter	Total	Sex				Race				Age group			
		Male		Female		White [1]		Negro		Under 20 years		20 years and over [2]	
		Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total
1940 total	[3] 5,226,688	3,080,032	58.9	2,146,656	41.1	4,596,351	87.9	630,337	12.1	2,137,542	40.9	3,089,146	59.1
January–March	1,125,165	695,279	61.8	429,886	38.2	981,254	87.2	143,911	12.8	321,584	28.6	803,581	71.4
April–June	1,133,420	673,716	59.4	459,704	40.6	1,007,271	88.9	126,149	11.1	502,971	44.4	630,449	55.6
July–September	1,471,715	852,820	57.9	618,895	42.1	1,287,239	87.5	184,476	12.5	697,724	47.4	773,991	52.6
October–December	1,496,388	858,217	57.4	638,171	42.6	1,320,587	88.3	175,801	11.7	615,263	41.1	881,125	58.9
1941 total	[4] 6,677,584	3,701,467	55.4	2,976,117	44.6	5,890,916	88.2	786,668	11.8	3,174,241	47.5	3,503,343	52.5
January–March	1,340,974	830,949	62.0	510,025	38.0	1,166,491	87.0	174,483	13.0	479,266	35.7	861,708	64.3
April–June	1,859,862	1,042,505	56.1	817,357	43.9	1,680,426	90.4	179,436	9.6	1,022,740	55.0	837,122	45.0
July–September	2,067,425	1,151,152	55.7	916,273	44.3	1,797,941	87.0	269,484	13.0	1,034,988	50.1	1,032,437	49.9
October–December	1,409,323	676,861	48.0	732,462	52.0	1,246,058	88.4	163,265	11.6	637,247	45.2	772,076	54.8
1942													
January–March	1,215,917	634,255	52.2	581,662	47.8	1,071,400	88.1	144,517	11.9	466,993	38.4	748,924	61.6

[1] Represents all races other than Negro.
[2] Includes a small number for whom data are not known.
[3] Because of recording and tabulating procedures, total differs slightly from corresponding total in table 4.
[4] Excludes 317 applicants whose sex and/or race are unknown.

exclusive of those not in the labor force, such as housewives and persons not able to work.

Distribution by sex and race.—Despite the 9.3-percent decrease in the total number of accounts established during the first quarter of 1942, the number of accounts established for women was 14 percent greater than in the first quarter of 1941, when women constituted 38 percent of all applicants for account numbers. In the first quarter of 1942 the proportion of women had risen to 48 percent (table 5), the highest percentage for the first quarter of any year.

The number of both white and Negro applicants declined as compared with the first 3 months of 1941. The decrease for Negroes was 17.2 percent, and for white applicants 8.2 percent. The greater reduction for the former, however, is not necessarily the result of a decline in job opportunities for Negro workers as compared with white workers, since preliminary data show that, in proportion to population, relatively more Negro than white men obtained social security cards during the first 3 years of the program.

Distribution by age.—Account-number data indicate that not only women but also young persons are taking a greater part in the civilian war effort.

Table 6.—*Distribution of applicants for account numbers by sex, race, and age group, January–March 1942*

Age group	Total			Male			Female		
	Total	White [1]	Negro	Total	White [1]	Negro	Total	White [1]	Negro
Total	1,215,917	1,071,400	144,517	634,255	554,119	80,136	581,662	517,281	64,381
Under 15	12,970	11,017	1,953	11,849	9,988	1,861	1,121	1,029	92
15–19	454,023	412,408	41,615	272,675	241,778	30,897	181,348	170,630	10,718
20–24	158,839	130,100	28,739	63,997	51,041	12,956	94,842	79,059	15,783
25–29	91,212	73,909	17,303	30,444	24,640	5,804	60,768	49,269	11,499
30–34	95,390	81,336	14,054	36,503	31,421	5,082	58,887	49,915	8,972
35–39	97,021	85,064	11,957	39,479	34,457	5,022	57,542	50,607	6,935
40–44	87,539	78,015	9,524	39,376	34,663	4,713	48,163	43,352	4,811
45–49	74,735	67,329	7,406	40,010	35,346	4,664	34,725	31,983	2,742
50–54	56,467	51,600	4,867	33,813	30,455	3,358	22,654	21,145	1,509
55–59	39,078	35,908	3,170	26,461	24,047	2,414	12,617	11,861	756
60–64	25,067	23,212	1,855	19,060	17,540	1,520	6,007	5,672	335
65–69	13,962	12,642	1,320	11,823	10,658	1,165	2,139	1,984	155
70 and over	9,493	8,810	683	8,684	8,049	635	809	761	48
Unknown	121	50	71	81	36	45	40	14	26

[1] Represents all races other than Negro.

Applicants under age 20 comprised 28.6 percent of the total receiving account numbers in the first quarter of 1940, 35.7 percent in the first quarter of 1941, and 38.4 percent in the first quarter of 1942 (table 5). The rise in the first quarter of this year was due entirely to the exceptionally large increase in the number of accounts established for persons under age 18. A 24-percent decrease in accounts established for persons aged 18 and 19 in the first quarter of 1942 as compared with the same quarter of 1941 indicates that a large proportion of workers now 18 and 19 years of age had already been absorbed into the labor market. The decrease in the number of these applicants, however, was more than offset by the 32-percent increase in the number of accounts established for persons under 18.

Age	January–March		Percentage change
	1942	1941	
Total under 20	466,993	479,266	−2.6
Under 15	12,970	6,676	+94.3
15	27,507	13,087	+110.2
16	74,902	46,793	+60.1
17	129,055	118,188	+9.2
18	121,933	148,138	−17.7
19	100,626	146,384	−31.3

This heavy influx of young applicants reflects the relaxation of legal working-age requirements in response to the growing demand for the services of young persons as unskilled workers.

Significant tendencies are also apparent from an analysis of the number of accounts established for workers aged 20 and over (table 6). Although there were 14 percent more accounts established for women in the first quarter of 1942 than in the first quarter of 1941, there were 24 percent more for women aged 25–44, the group which consists mostly of housewives and women in noncovered jobs.

While the number of accounts set up for men decreased 24 percent from the first quarter of 1941, the accounts established for men aged 20–44 decreased 42 percent. It may be assumed that the applicants in this age group had been employed in noncovered work, since it is estimated on the basis of census data that practically all men aged 20–44 were gainfully employed at some time during the year. The decline in the number of applications from this group indicates that the number of male workers in noncovered employment without an account number is decreasing.

The number of accounts established for workers aged 60 and over was practically the same in the first quarter of 1941 as in the first quarter of 1942. About 25,000 were established for those aged 60–64 and 23,000 for those 65 and over.

Distribution by State.—Although the total number of accounts established for persons throughout the United States was smaller in the first quarter

Table 7.—*Applicants for account numbers, by State, January-March 1942 and January-March 1941*

Social Security Board region and State	January–March		Percentage change
	1942	1941	
Total	1,215,917	1,340,974	−9.3
Region I:			
Connecticut	19,067	19,799	−3.7
Maine	8,073	7,023	+15.0
Massachusetts	36,726	47,978	−23.5
New Hampshire	4,274	3,962	+7.9
Rhode Island	6,815	7,958	−14.4
Vermont	2,867	2,362	+21.4
Region II:			
New York	135,979	124,299	+9.4
Region III:			
Delaware	2,474	2,741	−9.7
New Jersey	38,149	34,941	+9.2
Pennsylvania	89,619	79,847	+12.2
Region IV:			
District of Columbia	10,507	8,508	+23.5
Maryland	19,153	19,985	−4.2
North Carolina	31,193	63,271	−50.7
Virginia	28,865	41,916	−31.1
West Virginia	14,399	20,839	−30.9
Region V:			
Kentucky	23,309	37,116	−37.2
Michigan	41,157	51,351	−19.9
Ohio	57,311	62,268	−8.0
Region VI:			
Illinois	62,707	72,611	−13.6
Indiana	30,956	34,517	−10.3
Wisconsin	21,857	21,817	+.2
Region VII:			
Alabama	29,748	36,964	−19.5
Florida	21,978	27,124	−19.0
Georgia	28,272	36,730	−23.0
Mississippi	15,382	17,213	−10.6
South Carolina	16,740	26,466	−36.7
Tennessee	30,780	48,512	−36.6
Region VIII:			
Iowa	17,876	17,177	+4.1
Minnesota	19,852	17,382	+14.2
Nebraska	9,115	8,933	+2.0
North Dakota	2,661	3,025	−12.0
South Dakota	3,363	3,284	+2.4
Region IX:			
Arkansas	23,926	19,694	+21.5
Kansas	15,507	15,717	−1.3
Missouri	39,721	43,270	−8.2
Oklahoma	22,841	15,646	+46.0
Region X:			
Louisiana	20,984	31,941	−34.3
New Mexico	4,149	5,994	−30.8
Texas	71,632	71,094	+.8
Region XI:			
Arizona	5,675	5,738	−1.1
Colorado	9,725	9,070	+7.2
Idaho	3,507	3,587	−2.2
Montana	3,340	4,022	−17.0
Utah	4,829	3,317	+45.6
Wyoming	1,341	2,089	−35.8
Region XII:			
California	74,058	68,294	+8.4
Nevada	1,343	974	+37.9
Oregon	10,511	12,850	−18.2
Washington	17,188	14,439	+19.0
Territories:			
Alaska	525	510	+2.9
Hawaii	3,891	4,809	−19.1

of 1942 than in the first quarter of 1941, several States showed significant increases, presumably as a result of expanded industrial activity (table 7). The increase of 24 percent in the number registered in the District of Columbia reflects in part the entrance of many workers into covered employment, probably in many cases to fill jobs left by employees recruited by the Government.

Almost 36 percent of all account numbers were issued to persons who registered in New York, Pennsylvania, Illinois, Texas, and California, all States with large populations. These five States accounted for 31 percent of all accounts established in the first quarter of 1941. These figures are consistent with the fact that almost one-third of the total value of war contracts in the United States during the period June 1940–April 1942 was allocated to firms in these five States.

Operations Under the Railroad Retirement Act*

A decrease in the number of employee annuitants on the rolls of the Railroad Retirement Board (table 1) occurred in May for the first time since the beginning of the retirement system. This decline was the result of administrative factors accompanying the Board's move to Chicago.

Benefit payments certified to the Treasury, which usually increase from month to month but had dropped slightly in April, declined again in May, from $10.6 million to $10.4 million. For the first 5 months of 1942, however, the total was $52.8 million, 2.6 percent more than for the same months of 1941.

From the beginning of operations through the end of May, the Board has certified a total of $546 million, representing payments on 160,000 employee annuities, 48,600 pensions, 3,300 survivor annuities, 6,400 death-benefit annuities, and 53,900 lump-sum death benefits.

Applications for employee annuities totaled 1,301 in May, as compared with 1,424 in April. For the first 5 months of 1942, the total was 6,826, or 26 percent less than for the corresponding period of 1941. With improved employment conditions in the railroad industry, retirement on an annuity has become relatively less attractive than continuation in service.

The Board's removal to Chicago resulted in the smallest number—687—of new certifications of employee annuities since 1936. Partly as a result of the move, and partly because of the drop in applications, the monthly average of new certifications for the first 5 months of 1942 was only 1,155, compared with an average of 1,705 a year ago.

The 755 deaths among employee annuitants reported during May brought to 3,785 the total so far reported in 1942, 1.5 percent more than in the same period a year ago. Of the 160,000 annuitants certified by the end of May, 33,600 had died. Thus, about four out of five individuals for whom annuities have been certified since the

* Prepared by the Office of the Director of Research, Railroad Retirement Board, in collaboration with the Bureau of Research and Statistics, Social Security Board.

Table 1.—*Railroad retirement: Number and amount of annuities and pensions in force and net benefit payments certified to the Secretary of the Treasury, by class of payment, May 1942* [1]

Period and administrative action	Total		Employee annuities		Pensions to former carrier pensioners		Survivor annuities		Death-benefit annuities [2]	
	Number	Amount	Number	Amount	Number	Amount	Number	Amount	Number	Amount
In force as of Apr. 30, 1942	157,340	$10,054,162	125,489	$8,269,858	28,267	$1,666,204	3,011	$97,221	573	$20,878
During May 1942:										
Initial certifications	744	44,862	687	42,811	0	0	15	508	42	1,541
Terminations by death (deduct)	1,137	69,597	753	49,068	296	17,394	7	249	79	2,885
In force as of May 31, 1942 [3]	156,914	10,029,841	125,387	8,263,894	27,975	1,649,016	3,016	97,396	536	19,534
Total payments (net)		[4]10,449,134		8,446,066		1,622,061		99,320		25,769

[1] For definition of classes of payments, see the Bulletin, July 1939, p. 7. Except for total payments which are on calendar-month basis, data are based on month normally ended on 20th calendar day in which annuity or pension was first certified or terminated upon notice of death, or in which other administrative action was taken by the Board, rather than on month in which annuity or pension began to accrue, beneficiary died, or administrative action was effective. In-force payments as of end of month reflect administrative action through the 20th. Cents omitted.

[2] In a few cases, payments are made to more than 1 survivor on account of death of 1 individual; such payments are counted as single items. Terminations include those by death and by expiration of 12-month period for which death-benefit annuities are payable; nearly all terminations are of latter type.

[3] After adjustments for recertifications, reinstatements, and terminations for reasons other than death (suspension, return to service, recovery from disability, commutation to lump-sum payments).

[4] Includes $255,916 for lump-sum death benefits.

beginning of operations are still on the rolls.

The excess of terminations over certifications resulted, after some minor adjustments, in a decrease of 102 in the number of employee annuities in force. At the end of May the number of annuities totaled 125,387, and the monthly amount payable was $8.3 million; the average monthly payment was $65.91. The average includes some annuities subject to recertification and will therefore be increased somewhat when these are recertified on a final basis.

No new pensions were certified during May, but there were 296 terminations on account of death. For 1942 to date, 1,499 reports of death were received, 21 percent less than a year ago. Although the number of deaths among pensioners has decreased almost steadily, the proportion tends to increase as the average age of pensioners on the rolls increases. During May, $1.6 million was certified for the 27,975 pensions in force at the end of the month; the average monthly payment was $58.95.

The number of survivor annuitants and death-benefit annuitants on the rolls remained about the same as in April. At the end of May the numbers were, respectively, 3,016 with an average monthly payment of $32.29, and 536 with an average monthly payment of $36.45.

The Board certified 849 lump-sum death benefits in May, bringing to 4,742 the total for the year, compared with 5,974 for the first 5 months of 1941. The average benefit certified for May was $289.57, as compared with $304.23 for April. Since the amount of this benefit is based on the total compensation credited to an employee after December 31, 1936, the average benefit tends to increase. A decrease sometimes results in a particular month, as it did in May, when claims certified in that month include a large proportion filed by relatively low-paid employees. For the first 5 months of 1942, the average benefit initially certified was $293.98, or 26 percent more than in the same period last year.

SOCIAL AND ECONOMIC DATA

BUREAU OF RESEARCH AND STATISTICS

Social Security and Other Income Payments to Individuals

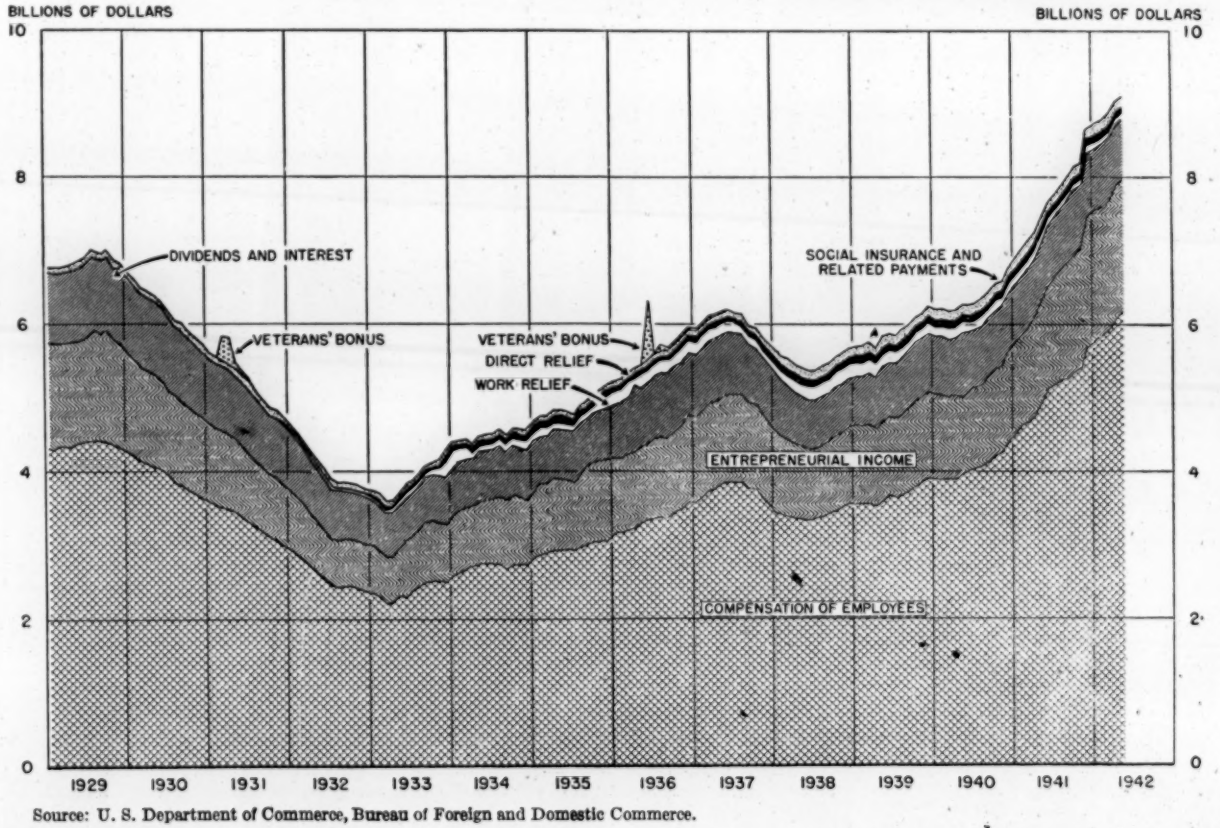
Income payments to individuals, continuing the uninterrupted rise which started with July 1940, amounted to $9.1 billion in May (table 1), an increase of 0.7 percent over April and of 22 percent over May 1941. The gain of $65 million over the April total was due entirely to the increase in compensation of employees, since each of the other classifications decreased.

Compensation of employees amounted to $6.2 billion, an increase of $122 million or 2.0 percent over April. This increase is in line with the rise in employment as reported in the WPA monthly report of employment and unemployment. According to this survey, employment in May is estimated at 51.6 million, an increase of 1.8 percent over April. Since August 1941, the employment level has remained relatively stable, while compensation of employees has increased steadily. Indications are, therefore, that during this period the increase in compensation was due primarily to higher wage rates, longer working hours, and the shifting of many workers to jobs paying higher wages.

Entrepreneurial income, net rents, and royalties decreased 1.8 percent from April, but were still 29 percent above May 1941. While there was an increase of $145 million in total payments of these types from January to May 1941, for the corresponding months of 1942 there was a decrease of $6 million.

Dividends and interest decreased for the fifth successive month, and in May amounted to $840

Chart 1.—*Income payments in the continental United States, January 1929–May 1942*



Source: U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce.

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Table 1.—*Income payments in the continental United States, by specified period, 1936–42* [1]

[In millions; data corrected to July 2, 1942]

Year and month [2]	Total	Compensation of employees [3]	Entrepreneurial income, net rents, and royalties	Dividends and interest	Work relief [4]	Direct relief [5]	Social insurance and related payments [6]	Veterans' bonus
Calendar year:								
1936	$68,024	$40,027	$13,003	$9,785	$2,155	$672	$955	$1,427
1937	72,365	44,689	14,162	9,891	1,639	836	1,020	128
1938	66,135	40,845	12,369	8,233	2,094	1,008	1,529	57
1939	70,809	43,981	13,346	8,891	1,870	1,071	1,616	34
1940	76,404	48,639	13,840	9,421	1,577	1,098	1,801	28
1941	92,122	60,782	17,352	9,910	1,213	1,112	1,734	19
1941								
May	7,482	4,940	1,377	810	115	93	146	1
June	7,667	5,107	1,397	817	104	93	146	3
July	7,763	5,172	1,441	826	86	90	146	2
August	7,882	5,241	1,494	832	80	90	143	2
September	7,994	5,265	1,579	841	79	89	140	1
October	8,130	5,363	1,606	851	80	89	140	1
November	8,196	5,405	1,617	863	79	90	140	2
December	8,666	5,678	1,781	879	87	92	148	1
1942								
January	8,729	5,748	1,777	870	77	94	162	1
February	8,794	5,854	1,745	865	72	95	162	1
March	8,881	5,946	1,741	858	75	94	166	1
April	9,049	6,073	1,804	850	68	92	161	1
May	9,114	6,195	1,771	840	62	90	155	1

[1] Compensation of employees, entrepreneurial income, net rents, and royalties, and dividends and interest adjusted for seasonal variation.

[2] For annual and monthly figures 1929–40, see the Bulletin, August 1941, table 1, pp. 74–76.

[3] Wage and salary payments minus deductions for employee contributions to social insurance and related programs. Includes industrial pensions and payments to members of the armed forces.

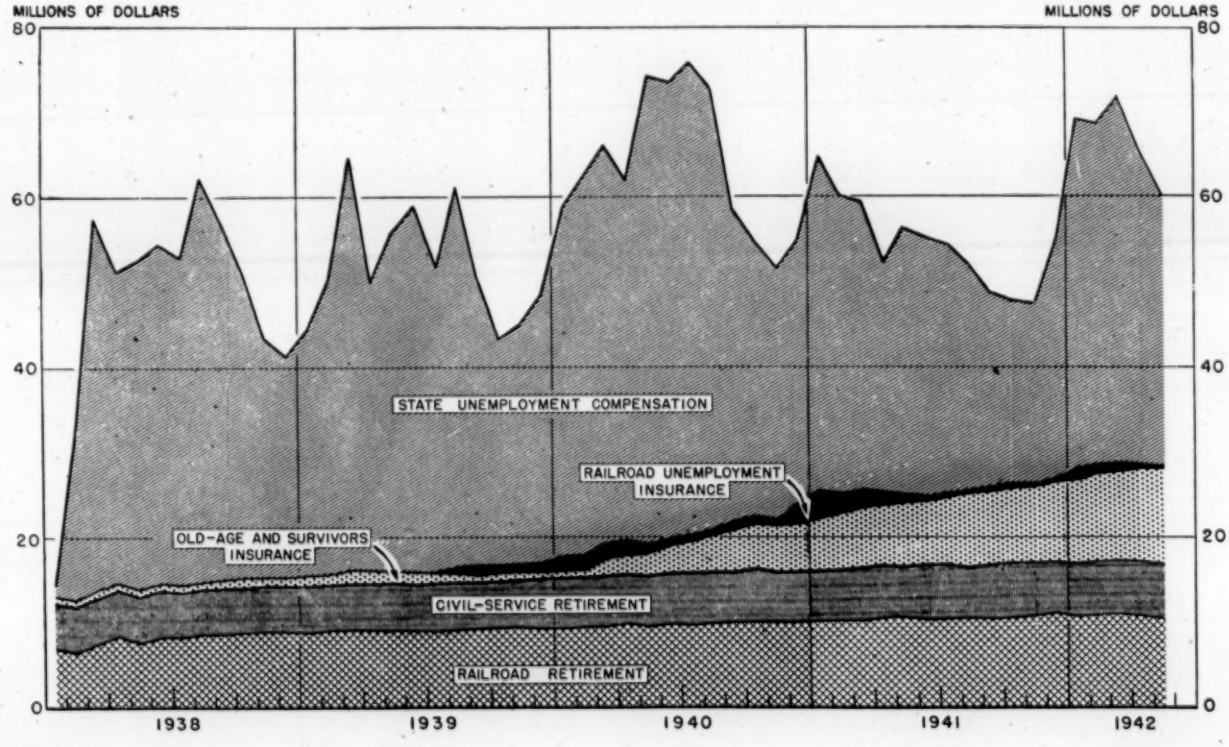
[4] Earnings of persons employed by the CCC, NYA, and WPA. Excludes earnings of persons employed on other Federal agency projects financed from emergency funds; such earnings are included in the column "Compensation of employees."

[5] Payments to recipients under the 3 special public assistance programs and general relief, the value of food stamps issued by the Agricultural Marketing Administration under the food stamp plan, and subsistence payments certified by the Farm Security Administration.

[6] Represents payments under programs of old-age and survivors insurance, railroad retirement, Federal, State, and local retirement, veterans' pensions, workmen's compensation, State unemployment compensation, and railroad unemployment insurance.

Source: U. S. Department of Commerce, Bureau of Foreign and Domestic Commerce.

Chart 2.—*Payments under selected social insurance and retirement programs, January 1938–May 1942*



million, 1.2 percent less than in April. The trend in these payments is directly opposite to last year's, when dividends and interest increased each month during the year.

Work relief and direct relief payments in May were less than in April or in May of last year. Work relief payments were only slightly more than half the amount expended a year ago. With reduced WPA appropriations, discontinuance of the CCC, and increased employment opportunities, further reductions in these payments will occur.

Payments under social insurance and related programs decreased 3.7 percent from April to $155 million. This drop can be attributed to the decrease of $5.0 million in unemployment insurance payments, for payments under other programs either remained at the same level or changed only slightly.

May payments to beneficiaries under the five programs summarized in table 2 amounted to $60.1 million, or 39 percent of all social insurance and related payments as estimated by the Department of Commerce. Unemployment insurance payments, which accounted for slightly more than half of the total, were at approximately the same

Table 2.—*Payments under selected social insurance and retirement programs, by specified period, 1936–42* [1]

[In thousands]

Year and month	Total	Retirement and survivor payments									Refunds under the Civil Service Commission to employees leaving service [6]	Unemployment insurance payments		
		Total	Monthly retirement payments [2]			Survivor payments						Total	State unemployment compensation laws [8]	Railroad Unemployment Insurance Act [9]
						Monthly payments		Lump-sum payments						
			Social Security Act [3]	Railroad Retirement Act [4]	Civil Service Commission [5]	Social Security Act [6]	Railroad Retirement Act [4]	Social Security Act [7]	Railroad Retirement Act [4]	Civil Service Commission [5]				
Calendar year:														
1936	$59,372	$56,377	-------	$683	$51,630	-------	$2	-------	-------	$4,062	$2,864	$131	$131	-------
1937	105,429	99,818	-------	40,001	53,694	-------	444	$1,278	-------	4,401	3,479	2,132	2,132	-------
1938	566,752	169,640	-------	96,766	56,118	-------	1,383	10,478	$291	4,604	3,326	393,786	393,786	-------
1939	625,748	187,837	-------	107,282	58,331	-------	1,451	13,895	1,926	4,952	2,846	435,065	429,298	$5,767
1940	764,399	226,533	$21,075	114,166	62,019	$7,784	1,448	11,734	2,497	5,810	3,277	534,589	518,700	15,889
1941	653,390	289,919	55,141	119,913	64,933	25,454	1,559	13,328	3,421	6,170	4,615	358,856	344,321	14,535
1941														
May	56,486	23,680	4,356	10,003	5,401	1,958	133	1,080	367	382	384	32,422	31,574	848
June	55,361	23,950	4,496	9,973	5,387	2,054	135	1,026	242	637	373	31,038	30,561	477
July	54,465	24,466	4,718	9,964	5,418	2,201	131	1,179	317	538	337	29,662	29,307	355
August	52,065	24,537	4,901	9,999	5,406	2,308	133	1,155	278	357	484	27,044	26,494	550
September	48,915	24,906	5,024	10,081	5,452	2,375	132	986	251	605	455	23,554	22,942	612
October	47,935	25,390	5,235	10,114	5,462	2,498	134	1,100	303	544	484	22,061	21,430	631
November	47,715	25,551	5,383	10,199	5,516	2,579	129	1,029	256	460	489	21,675	21,066	609
December	55,417	26,184	5.611	10,189	5,519	2,736	134	1,131	362	502	460	28,773	27,847	926
1942														
January	69,311	26,374	5,811	10,102	5,557	2,827	128	1,267	258	424	484	42,453	41,056	1,397
February	68,614	26,780	6,074	10,161	5,549	2,997	133	1,291	301	274	622	41,212	39,884	1,328
March	71,985	27,234	6,243	10,223	5,532	3,109	127	1,185	306	509	465	44,286	43,035	1,251
April	65,179	27,700	6,430	10,198	5,572	3,240	128	1,397	238	497	468	37,011	36,311	700
May	60,077	27,540	6,544	10,068	5,594	3,312	125	1,239	256	402	514	32,023	31,704	319

[1] Payments to individual beneficiaries under programs; data exclude cost of administration. 1941 calendar-year totals represent sum of unrounded figures; hence may differ slightly from sum of rounded amounts. For detailed data see tables in program sections of the Bulletin.

[2] Represents old-age retirement benefits under all acts and disability retirement benefits under Railroad Retirement and Civil Service Retirement Acts.

[3] Amounts, including retroactive payments, certified to the Secretary of the Treasury for payment; represent primary benefits, wife's benefits, and benefits to children of primary beneficiaries. Distribution by type of benefit partly estimated. 1940 total and monthly figures for 1941 revised as of Apr. 10, 1942.

[4] Amounts, including retroactive payments, certified to the Secretary of the Treasury for payment, minus cancelations, during month ended on 20th calendar day through November 1941; for December 1941, amounts certified from Nov. 21 through Dec. 31; for subsequent months amounts certified during calendar month. Monthly payments to survivors include annuities to widows under joint and survivor elections and 12-month death-benefit annuities to widows and next of kin. Calendar-year totals revised as of May 10, 1942.

[5] Principally payments under civil-service retirement and disability fund but includes also payments under Canal Zone retirement and disability fund and Alaska Railroad retirement and disability fund administered by the Civil Service Commission. Monthly retirement payments include accrued annuities to date of death paid to survivors. Data for calendar years 1936–39 estimated on basis of data for fiscal years. For discussion of benefits and beneficiaries under the Civil Service Retirement Act, see the Bulletin, April 1941, pp. 29–42.

[6] Amounts, including retroactive payments, certified to the Secretary of the Treasury for payment; represent widow's benefits, widow's current benefits, parent's benefits, and orphan's benefits. Distribution by type of benefit partly estimated. 1940 total and monthly figures for 1941 revised as of Apr. 10, 1942.

[7] Amounts certified to the Secretary of the Treasury for payment; represent payments at age 65 for 1937–August 1939, payments with respect to deaths of covered workers prior to Jan. 1, 1940, for entire period, and, beginning January 1940, payments with respect to deaths of covered workers after Dec. 31, 1939. Payments at age 65 totaling $651,000 in 1937, $4.7 million in 1938, and $4.6 million in 1939 are not survivor payments.

[8] Amount of checks issued, reported by State agencies to the Bureau of Employment Security. Annual figures adjusted for voided benefit checks; monthly figures unadjusted.

[9] Amounts certified by regional offices of the Railroad Retirement Board to disbursing officers of the Treasury in same city.

level as a year ago. Thus, the gain of $3.6 million over last May is due to further expansion in the retirement programs.

Payments under the State unemployment compensation programs were slightly higher than in May 1941. Liberalized benefit formulas and higher base-period earnings rather than a higher volume of unemployment account for this increase, since the average number of weeks compensated had declined to 610,000 in May as compared with 659,000 a year earlier (table 3). Payments under the Railroad Unemployment Insurance Act were 62 percent below the level of a year ago, and the number of beneficiaries showed approximately the same percentage decrease.

During May, the old-age and survivors insurance and civil-service retirement programs expanded further with respect to both total amounts of monthly payments and numbers of beneficiaries. On the other hand, payments and beneficiaries under the Railroad Retirement Act declined, primarily because the removal of the central offices to Chicago resulted in administrative delays in the processing of new claims. The total amounts of lump-sum payments decreased under both the old-age and survivors insurance program and the civil-service retirement program, while under the railroad retirement program this type of payment increased.

Approximately 751,400 individuals received monthly benefits amounting to $25.6 million and 10,300 received lump-sum payments amounting to $1.9 million under the retirement and survivor programs in May. The group of 524,700 monthly beneficiaries under the old-age and survivors insurance program was composed of 238,000 retired workers, the wives of 68,500 of these workers, 10,200 of their minor children, and 208,000 survivors of deceased workers or annuitants. This latter group is composed of 20,200 widows aged

Table 3.—*Individuals receiving payments under selected social insurance and retirement programs, by month, May 1941–May 1942*

[In thousands]

Year and month	Retirement and survivor beneficiaries								Separated employees receiving refunds under the Civil Service Commission [9]	Unemployment insurance beneficiaries	
	Monthly retirement beneficiaries			Survivor beneficiaries							
				Monthly beneficiaries		Lump-sum beneficiaries [6]					
	Social Security Act [1]	Railroad Retirement Act [2]	Civil Service Commission [3]	Social Security Act [4]	Railroad Retirement Act [5]	Social Security Act [7]	Railroad Retirement Act	Civil Service Comission [8]		State unemployment compensation laws [10]	Railroad Unemployment Insurance Act [11]
1941											
May	209.1	148.9	66.8	117.9	3.4	7.9	1.5	0.4	2.5	659.0	20.7
June	216.4	149.6	66.9	124.8	3.4	7.4	1.0	.6	2.6	683.9	11.4
July	226.1	150.2	67.1	132.8	3.5	8.6	1.3	.6	2.5	611.1	10.0
August	235.9	150.6	67.5	140.5	3.5	8.5	1.1	.5	3.3	571.9	12.0
September	244.0	151.3	67.5	146.4	3.6	7.2	1.0	.7	3.0	493.4	13.2
October	253.4	151.8	67.8	154.0	3.6	8.0	1.1	.6	3.4	430.0	12.9
November	261.3	152.5	68.4	160.4	3.6	7.5	1.0	.5	4.3	470.6	13.4
December	271.5	152.9	68.6	168.5	3.6	8.2	1.2	.5	3.5	523.0	22.4
1942											
January	282.5	152.8	69.3	176.1	3.6	9.1	.9	.5	4.1	796.6	35.1
February	292.9	153.3	69.1	185.2	3.6	9.3	1.0	.3	4.2	837.6	33.6
March	301.5	153.5	69.2	192.3	3.6	8.6	1.0	.6	4.2	803.1	29.2
April	310.6	153.8	69.3	200.8	3.6	10.1	1.0	.6	4.3	668.3	16.9
May	316.8	153.4	69.7	207.9	3.6	9.0	.8	.5	4.9	609.7	7.2

[1] Primary beneficiaries and their wives and children, for whom monthly benefits were certified to the Secretary of the Treasury during month.

[2] Employee annuitants and pensioners on roll as of 20th of month; includes disability annuitants.

[3] Annuitants under Civil Service, Canal Zone, and Alaska Railroad Retirement Acts; represents age and disability retirements, voluntary and involuntary retirements after 30 years' service, and voluntary retirement after 15 years' service, and involuntary separations after not less than 15 years' service. Includes persons receiving survivor benefits under joint and survivor elections, numbering 55 in May 1942. Figures not adjusted for suspension of annuities of persons reemployed under the National Defense Act of June 28, 1940, numbering 748 in May 1942.

[4] Widows, parents, and orphans for whom monthly benefits were certified to the Secretary of the Treasury during month.

[5] Widows receiving survivor benefits under joint and survivor elections and next of kin receiving death-benefit annuities for 12 months; number on roll as of 20th of month. Widows receiving both survivor and death-benefit annuities are counted twice, but 2 or more individuals sharing 1 death-benefit annuity are counted as 1.

[6] Number of deceased wage earners with respect to whose wage records payments were made to survivors; for railroad retirement beneficiaries, number certified in month ending on 20th calendar day.

[7] Represents deceased wage earners whose survivors received payments under either 1935 or 1939 act.

[8] See footnote 3 for programs covered. Represents employees who died before retirement age and annuitants with unexpended balances whose survivors received payments.

[9] See footnote 3 for programs covered.

[10] Represents average number of weeks of unemployment compensated in calendar weeks ended within month.

[11] Number of individuals receiving benefits during second and third weeks of month for days of unemployment in registration periods of 14 consecutive days.

65 and over, 51,200 widows under 65 with 134,100 children in their care, and the parents of 2,380 deceased wage earners. The 524,700 monthly beneficiaries represent almost 331,000 families. The number of beneficiaries receiving monthly retirement or survivor payments under the railroad retirement and civil-service retirement programs—226,700—is a close approximation of the number of families which received benefits, inasmuch as these programs do not provide supplementary benefits for the wives and children of retired workers.

Financial and Economic Data

Receipts

Social security and railroad retirement and unemployment tax receipts accounted for 29 percent of total Federal receipts in May (table 2). Despite the large increase in Federal receipts from other sources, this ratio was only slightly below that for May 1941, primarily because of the record level of old-age and survivors insurance contributions. For the first 11 months of the fiscal year 1941–42, Federal income-tax collections totaled $5,874 million, $3,321 million more than in the corresponding period of 1940–41. Miscellaneous internal-revenue collections, which include the national defense excises, were $847 million above those of the first 11 months of 1940–41.

The $204 million collected in May (table 3) under the Federal Insurance Contributions Act exceeded collections for any previous month. The amount was $54.1 million more than collections in May 1941 and $22.3 million more than collections in February 1942, the second month of the previous quarter. Collections in April and May together were well above receipts for any previous full quarter. Second-quarter receipts are based primarily on pay rolls in January, February, and March, during which time pay rolls in manufacturing rose from the December level of 169.9 to 182.9 in March, according to the Bureau of Labor Statistics unadjusted index.

Table 1 shows, for the past 3 years, quarterly averages for three major economic indexes and Federal insurance contributions based on wages paid. Insurance contributions reflect pay rolls in all covered employment, whereas the industrial-production index relates only to manufacturing and mining, and excludes construction, service, trade, finance, transportation, and utilities. The indexes of employment and pay rolls refer solely to manufacturing.

Although the index of industrial production rose only 1 point from the fourth quarter of 1941 to the first quarter of 1942 and the index of factory employment declined 1 point, the index of factory pay rolls increased nearly 11 points. April and May receipts indicate that insurance contributions will show a rise of approximately 10 percent from the first to the second quarter of 1942. These contributions are affected by the fact that the largest proportion of the tax receipts for the group of employees who earn more than $3,000 a year is based on first-quarter earnings.

The upward movement in production and pay rolls continued during the first 2 months of the second quarter. The Federal Reserve Board unadjusted index of industrial production, which rose to 171 in April, increased another 6 points in May. Likewise, the unadjusted index of factory employment rose from 136.1 in April to 137.0 in May, while the pay-roll index rose 6 points to 192.6. Since these indicators were continuing to

Table 1.—*Average indexes of industrial production, employment, pay rolls, and Federal insurance contributions,[1] by quarter, 1939–May 1942*

[Corrected to June 30, 1942]

Year and quarter	Index of industrial production [2]	Index of factory employment [3]	Index of factory pay rolls [3]	Federal insurance contributions (in millions)
1939				
First	99	95.9	86.9	$133.3
Second	100	96.4	87.0	139.5
Third	109	99.9	90.8	141.8
Fourth	125	107.5	103.9	153.1
1940				
First	114	104.8	99.6	148.6
Second	117	102.9	98.4	161.2
Third	125	107.3	105.1	164.7
Fourth	136	114.9	118.3	162.8
1941				
First	140	117.7	126.2	170.9
Second	153	125.1	143.7	192.2
Third	163	133.0	157.8	207.7
Fourth	166	134.8	167.4	218.5
1942				
First	167	133.7	178.2	222.8
Second (2 months)	(4)	(4)	(4)	242.9

[1] Based on unadjusted monthly index of Federal Reserve Board; 1935–39=100.
[2] Based on unadjusted index of U. S. Bureau of Labor Statistics; 1923–25=100.
[3] Not available.

advance in June, collections in the third quarter of 1942 may be at an even higher level.

The index of the cost of living in 21 large cities, as computed by the Bureau of Labor Statistics, rose 0.8 percent from mid-April to mid-May. Between May 15 and June 2 there was a slight decline—the first since November 1940. The index of living costs on June 2 was 11 percent higher than on June 15, 1941, and 16 percent higher than the average for the 5 years 1935–39. The June 2 figures are based on a special survey conducted by the BLS to ascertain the immediate effect of the General Maximum Price Regulation which became effective in retail trade on May 18.

Collections of $9.3 million under the Federal Unemployment Tax Act during May brought to $119 million the total received during the fiscal year. These collections are considerably larger than the $67.1 million expended during these 11 months for grants for unemployment compensa-

Table 2.—*Social security and total Federal receipts, expenditures, and public debt, by specified period, 1936–42*

[In millions]

Period	General and special accounts												Public debt				
	Receipts of Federal Government				Expenditures [4] of Federal Government												
						Under the Social Security Act		Under the Railroad Retirement Board									
	Total [1]	Social security taxes [2]	Railroad retirement and unemployment taxes [3]	All other	Total [1]	Administrative expenses and grants to States [5]	Net appropriations and transfers to old-age and survivors insurance trust fund	Administrative expenses [6]	Transfers to railroad retirement account	All other	Excess receipts (+) or expenditures (−)	Trust accounts, etc., [7] excess receipts (+) or expenditures (−)	Change in general fund balance	Total	Old-age and survivors insurance trust fund	Unemployment trust fund [8]	Railroad retirement account	All other
Fiscal year:																	
1936–37	$5,294	$252	(9)	$5,042	$8,442	$183	$265	$1	.....	$7,993	−$3,149	+$374	−$128	$36,425	$267	$312	.....	$35,846
1937–38	6,242	604	$150	5,488	7,626	291	387	3	$146	6,799	−1,384	+306	−338	37,165	662	872	$66	35,565
1938–39	5,668	631	109	4,928	9,210	342	503	[10] 3	107	8,255	−3,542	+890	+622	40,440	1,177	1,267	67	37,929
1939–40	5,925	712	126	5,087	9,537	379	[10] 539	[10] 8	121	8,490	−3,612	+137	−947	42,968	1,738	1,710	79	39,441
1940–41	8,269	788	144	7,337	13,372	447	661	[10] 7	124	12,133	−5,103	−148	+742	48,961	2,381	2,273	74	44,233
11 months ended:																		
May 1940	5,141	708	98	4,335	8,514	368	[10] 403	[10] 7	121	7,615	−3,374	+197	−809	42,808	1,565	1,721	77	39,445
May 1941	6,991	784	116	6,091	11,842	430	660	[10] 6	124	10,622	−4,851	+111	+14	47,721	2,146	2,254	84	43,237
May 1942	11,174	1,011	141	10,022	28,734	490	867	[10] 9	141	27,227	−17,560	−1,870	+179	68,571	2,927	3,106	102	62,436
1941																		
May	541	157	8	376	1,288	35	147	1	.....	1,105	−747	−264	−521	47,721	2,146	2,254	84	43,237
June	1,277	4	28	1,245	1,530	17	1	1	.....	1,511	−252	−259	+729	48,961	2,381	2,273	74	44,233
July	456	47	1	408	1,640	60	43	1	46	1,490	−1,185	+599	−34	49,513	2,371	2,333	108	44,701
August	554	167	6	381	1,687	43	157	1	.....	1,486	−1,133	−2	+274	50,921	2,361	2,479	102	45,979
September	1,136	4	33	1,099	1,875	33	1	1	.....	1,840	−739	−293	−607	51,346	2,556	2,479	91	46,220
October	489	48	1	440	2,126	56	43	1	32	1,994	−1,637	−225	+376	53,584	2,546	2,538	112	48,388
November	730	175	5	550	2,024	40	166	1	.....	1,817	−1,294	−484	−322	55,040	2,536	2,706	102	49,696
December	1,214	6	36	1,172	2,544	33	2	1	.....	2,508	−1,329	−328	+1,241	57,938	2,736	2,732	91	52,379
1942																		
January	614	51	1	562	2,664	56	36	1	32	2,539	−2,050	−633	−610	60,012	2,726	2,771	112	54,403
February	937	253	4	680	2,808	37	179	1	.....	2,591	−1,871	+114	+612	62,381	2,761	2,923	102	56,595
March	3,548	5	44	3,499	3,422	31	1	1	.....	3,389	+126	−234	−69	62,419	2,923	2,910	91	56,495
April	732	42	1	689	3,790	49	37	1	32	3,671	−3,058	−126	−642	64,961	2,913	2,914	112	59,022
May	764	213	9	542	4,155	53	201	1	.....	3,900	−3,391	−257	−39	68,571	2,927	3,106	102	62,436

[1] Beginning July 1940, appropriations to old-age and survivors insurance trust fund minus reimbursements to the Treasury for administrative expenses are excluded from net receipts and expenditures of general and special accounts of the Treasury. These net appropriations are included here in both total receipts and expenditures for comparison with previous periods.

[2] Represents collections under the Federal Insurance Contributions Act and the Federal Unemployment Tax Act.

[3] Represents total collections under the Carriers Taxing Act and 10 percent of collections under the Railroad Unemployment Insurance Act (see table 3, footnote 5).

[4] Excludes public-debt retirement. Based on checks cashed and returned to the Treasury.

[5] Excludes funds for vocational rehabilitation program of the Office of Education and for disease and sanitation investigations of the Public Health Service (see table 4, footnote 1). Prior to Jan. 1, 1942, excludes grants to States for employment service administration under the Wagner-Peyser Act. Such grants are included in "all other"; since Jan. 1, 1942, includes Federal expenditures for operation of employment services in the States. Also excludes administrative expenses incurred by the Treasury prior to July 1940 in administration of title II of the Social Security Act and the Federal Insurance Contributions Act. Includes expenses incurred by the Social Security Board in administration of the Wagner-Peyser Act, beginning July 1940.

[6] Includes expenditures for administration of railroad unemployment insurance, amounting to $500,000 in 1938–39, $4,987,000 in 1939–40, $3,397,000 in 1940–41, and $2,248,000 in 1941–42; also includes $5,315,000 expended since April 1941 for acquisition of service and compensation data of railroad workers in accordance with Public Res. 102, approved Oct. 9, 1940.

[7] Includes all trust accounts, increment resulting from reduction in weight of gold dollar, expenditures chargeable against increment on gold (other than retirement of national bank notes), and receipts from seigniorage.

[8] Beginning July 1939, contains separate book account for railroad unemployment insurance account and for each State employment security agency.

[9] Less than $500,000.

[10] Excludes amounts reimbursed to the Treasury for administrative expenses, which were part of transfer.

Source: Compiled from data in the Daily Statement of the U. S. Treasury.

tion administration and for the operation of the employment services in 1942 (table 4).

Total tax collections under the five selected social insurance programs listed in table 3 amounted to $366 million in May. About $222 million or 61 percent is included in gross receipts of the general and special accounts of the Treasury. The other 39 percent consists of State unemployment contributions, which are paid to designated State agencies, and 90 percent of railroad unemployment insurance contributions, which are deposited directly in the railroad unemployment insurance account. The $144 million in State unemployment contributions collected in May brought collections for the first 2 months of the second quarter to $266 million. The decline of $11.6 million as compared with collections

Table 3.—*Social insurance taxes under selected programs, by specified period, 1936–42*

[In thousands]

Period	Old-age survivors insurance		Unemployment insurance		
	Federal insurance contributions [1]	Taxes on carriers and their employees [2]	State unemployment contributions [3]	Federal unemployment taxes [4]	Railroad unemployment insurance contributions [5]
Cumulative through May 1942	$3,426,230	$652,629	$4,669,822	[6] $572,916	$180,222
Fiscal year:					
1936–37	194,346	345	(7)	[6] 57,751	
1937–38	514,406	150,132	(7)	[6] 90,104	
1938–39	530,358	109,257	803,007	100,869	
1939–40	604,694	120,967	853,955	107,523	49,167
1940–41	690,555	136,942	888,450	97,677	68,162
11 months ended:					
May 1940	601,799	94,611	843,420	106,504	34,303
May 1941	687,269	110,823	879,946	96,897	51,856
May 1942	891,872	134,987	1,087,946	118,992	62,893
1941					
May	149,679	7,979	105,763	7,453	957
June	3,286	26,120	8,495	780	16,306
July	44,815	872	146,570	2,234	50
August	159,525	5,638	107,460	7,477	573
September	3,366	31,111	6,781	910	18,103
October	45,674	1,058	148,239	2,169	86
November	168,458	5,202	119,673	6,808	939
December	4,323	33,866	10,447	1,267	19,209
1942					
January	38,579	1,277	154,912	12,710	107
February	181,446	4,161	122,536	71,269	786
March	2,773	41,574	5,471	1,995	22,351
April	39,173	1,206	122,109	2,853	5
May	203,740	9,023	143,747	9,302	684

[1] Tax effective Jan. 1, 1937, based on wages for employment as defined in Internal Revenue Code (ch. 9, subch. A, sec. 1426), payable by employers and employees.

[2] Tax effective Mar. 1, 1936, based on wages for employment as defined in Carriers Taxing Act, payable by carriers and employees.

[3] Represents contributions plus penalties and interest collected from employers and contributions from employees, deposited in State clearing accounts. For differences in State rates, see p. 52, table 7, footnote 1. Data include contributions based on wages from railroad industry prior to July 1, 1939. Subsequent transfers from State accounts to railroad unemployment insurance account in unemployment trust fund, amounting to $105,900,769 as of May 31, 1942, are not deducted. Figures reported by State agencies, corrected to May 31, 1942.

[4] Tax effective Jan. 1, 1936, based on wages for employment as defined in Internal Revenue Code (ch. 9, subch. C, sec. 1607), payable by employers only. Amounts represent Federal tax collections after deduction for amounts paid into State unemployment funds on covered wages earned in previous calendar year.

[5] Tax effective July 1, 1939, based on wages for employment as defined in Railroad Unemployment Insurance Act, payable by employers only. Computed from data in Daily Statement of the U. S. Treasury. Represents 10 percent which is deposited with the Treasury and appropriated to railroad unemployment insurance administration fund for expenses of the Railroad Retirement Board in administering act, and 90 percent which is deposited in railroad unemployment insurance account in unemployment trust fund and is not included in receipts of general and special accounts of the Treasury. Amounts, therefore, differ from figures on p. 70, table 2, which represent only the 10 percent deposited with the Treasury.

[6] Includes $40,561,886 subsequently refunded to States which did not collect taxes on 1936 pay rolls and in which employers paid full tax to the Federal Government.

[7] Not available.

Table 4.—*Federal appropriations and expenditures for administrative expenses and grants to States under the Social Security Act, by specified period, 1940–42* [1]

[In thousands]

Item	Fiscal year 1940–41		Fiscal year 1941–42	
	Appropriations [2]	Expenditures through May [3]	Appropriations [2]	Expenditures through May [3]
Total	$440,894	$430,029	$503,829	$489,844
Administrative expenses	27,694	28,888	26,129	28,961
Federal Security Agency, Social Security Board [4]	27,220	23,592	25,655	22,806
Department of Labor, Children's Bureau	364	258	364	334
Department of Commerce, Bureau of the Census	110	105	110	102
Department of the Treasury [5]	([6])	4,933	([6])	5,719
Grants to States	413,200	401,141	477,700	460,883
Federal Security Agency	402,000	390,203	466,500	449,581
Social Security Board	391,000	379,456	455,500	438,205
Old-age assistance	245,000	249,479	300,000	294,734
Aid to dependent children	75,000	61,228	74,000	68,551
Aid to the blind	10,000	6,940	9,000	7,862
Unemployment compensation administration	61,000	[7] 61,809	72,500	[7] 67,057
Public Health Service: Public health work	11,000	10,747	11,000	11,376
Department of Labor, Children's Bureau	11,200	10,938	11,200	11,302
Maternal and child health services	5,820	5,501	5,820	5,882
Services for crippled children	3,870	3,903	3,870	3,862
Child welfare services	1,510	1,534	1,510	1,558

[1] Excludes some funds appropriated and expended under the Social Security Act, because they are not separated from other Federal funds for similar purposes. Such is the case with funds for vocational rehabilitation for which $113,000 was appropriated for 1940–41 and $112,000 for 1941–42 for administration in the Office of Education, and $2,000,000 for 1940–41 and $2,650,000 for 1941–42 for grants to States. For disease and sanitation investigations of the Public Health Service, appropriations were $1,625,000 for 1940–41 and $1,742,481 for 1941–42 in addition to grants to States shown in this table.

[2] Excludes unexpended balance of appropriations for previous fiscal year. Appropriations for 1941–42 include additional appropriation of $40,000,000 approved Apr. 28, 1942.

[3] Based on checks cashed and returned to the Treasury. Includes expenditures from reappropriated balance of appropriations for previous fiscal year.

[4] Includes amounts expended by the Board in administration of title II of the act, reimbursed to general fund of the Treasury. Includes amounts for administration of the Wagner-Peyser Act prior to Jan. 1, 1942. See footnote 7.

[5] Represents amounts expended by the Treasury in administration of title II of the Social Security Act and the Federal Insurance Contributions Act, reimbursed to general fund of the Treasury.

[6] Not available.

[7] Prior to Jan. 1, 1942, includes grants certified by the Social Security Board to States for employment service administration to meet requirements of unemployment compensation program, and excludes grants to States for employment service administration under the Wagner-Peyser Act, for which $3,000,000 was appropriated in 1940–41 and $3,100,000 in 1941–42. Since Jan. 1, 1942, includes grants for unemployment compensation administration and Federal expenditures for operation of employment services in the States.

Source: Various Federal appropriation acts (appropriations); Daily Statement of the U. S. Treasury (expenditures).

during January–February is chiefly attributable to tax-rate reductions in the States in which experience-rating provisions are effective.

Expenditures

Social security and railroad retirement expenditures, including net appropriations to the old-age and survivors insurance trust fund, represented 6.1 percent of total Federal expenditures in May. The corresponding percentage for May 1941 was 14.2 percent.

Social security expenditures for administration and grants to States through May of the fiscal year 1941–42 amounted to $490 million. This amount represented 97 percent of the fiscal year appropriations exclusive of unexpended balances carried over from the previous fiscal year (table 4). Expenditures have exceeded 1941–42 appropriations for grants for public health work, maternal and child health services, and child welfare services, for which unexpended appropriations from the previous fiscal year were available. Administrative expenditures, other than those of the Treasury Department, amounted to 89 percent of appropriations at the end of May.

Total Federal expenditures for May, including those from trust accounts, exceeded total receipts during the month by $3,648 million. This excess was accompanied by a rise of $3,610 million in the public debt and a decrease of $39 million in the general fund balance (table 2). Only 5.4 percent of the increase in public debt issues outstanding was absorbed by the three social insurance trust funds. The computed rate of interest on the total public debt continued to decline—from 2.368 percent as of April 30 to 2.349 percent as of May 31.

Old-Age and Survivors Insurance Trust Fund

During May, the old-age and survivors insurance trust fund acquired $24 million of publicly offered Treasury bonds, 1962–67 series, bearing 2½ percent interest. These bonds are dated May 5, 1942, and the interest is payable semiannually on June 15 and December 15 of each year. They will mature June 15, 1967, but may be called for

Table 5.—*Status of the old-age and survivors insurance trust fund, by specified period, 1936–42*

[In thousands

Period	Receipts [1]		Expenditures		Assets			
	Contributions appropriated to trust fund [2]	Interest received [3]	Benefit payments [4]	Reimbursement for administrative expenses	Net total of Treasury notes and bonds acquired [5]	Cash with disbursing officer at end of period	Credit of fund account at end of period [6]	Total assets at end of period
Cumulative through May 1942	$1,580,013	$144,961	$198,935	$63,525	$2,927,334	$16,210	$223,969	$3,167,514
Fiscal year:								
1936–37		2,262	27		267,100	73	62	267,235
1937–38		15,412	5,404		395,200	1,931	113,012	777,243
1938–39		26,951	13,892		514,900	3,036	66	1,180,302
1939–40		42,489	15,805	12,288	560,900	6,098	500	1,744,698
1940–41	688,141	55,958	64,342	26,840	642,500	10,778	6,238	2,397,615
11 months ended:								
May 1940		249	13,175	6,183	388,000	3,735	142,259	1,711,194
May 1941	684,855	1,243	57,207	24,637	408,200	13,527	189,126	2,348,953
May 1942	891,872	1,889	99,476	24,397	546,734	16,210	223,969	3,167,514
1941								
May	149,679	131	6,975	2,203	−5,000	13,527	189,126	2,348,953
June	3,286	54,715	7,135	2,203	234,300	10,778	6,238	2,397,615
July	44,815	9	7,465	2,201	−10,000	13,310	48,864	2,432,774
August	159,525	40	7,906	2,201	−10,000	15,400	206,231	2,582,231
September	3,366	81	8,060	2,201	195,400	12,332	7,084	2,575,417
October	45,674	88	8,289	2,210	−10,000	14,040	50,640	2,610,680
November	168,458	113	8,406	2,210	−10,000	15,631	217,005	2,768,637
December	4,323	241	9,070	2,210	200,400	16,530	8,992	2,761,921
1942								
January	38,579	169	9,266	2,142	−10,000	17,260	45,601	2,789,261
February	181,446	190	9,639	2,142	34,334	17,614	180,422	2,959,117
March	2,773	460	10,275	2,142	162,600	17,309	9,289	2,949,932
April	39,173	237	10,376	2,369	−10,000	16,930	46,333	2,976,597
May	203,740	261	10,715	2,369	14,000	16,210	223,969	3,167,514

[1] Transfers to trust fund from appropriations totaled $1,705,000,000 as of June 30, 1940; for fiscal year 1936–37, $265,000,000 was transferred; for 1937–38, $387,000,000; for 1938–39, $503,000,000; and for 1939–40, $550,000,000.

[2] Beginning July 1940, trust fund appropriations equal taxes collected under the Federal Insurance Contributions Act.

[3] Interest on investments held is credited annually in June; on investments redeemed, in month of redemption.

[4] Based on checks cashed and returned to the Treasury.

[5] Minus figures represent net total of notes redeemed.

[6] Prior to July 1940, includes balance of appropriation available for transfer.

Source: Compiled from data in the Daily Statement of the U. S. Treasury.

redemption on and after June 15, 1962, at the option of the United States. This was the second time that publicly offered Treasury bonds were acquired by the old-age and survivors insurance trust fund; the first acquisition occurred in February 1942. The interest rate on these bonds is one-fourth of 1 percent above that at which special obligations could have been issued to the fund in May. During the month the redemption of $10 million of 3-percent old-age reserve account notes reduced the net amount of Government obligations acquired during May to $14 million (table 5). The sum made available by the redemption of these notes was credited to the account of the disbursing officer. Interest on the redeemed notes, amounting to $261,000, was credited to the fund account.

Total assets of the fund as of the end of the month amounted to $3,168 million. Of this total, $2,927 million represented investments; $16.2 million, cash with the disbursing officer; and $224 million, credit to the fund account. The investments consisted of $928 million in 3-percent special Treasury notes, $1,328 million in 2½-percent notes, $603 million in 2⅜-percent notes, $44.3 million in 2½-percent Treasury bonds, series 1967–72, and $24.0 million in 2½-percent Treasury bonds, series 1962–67.

Railroad Retirement Account

During May, Treasury notes amounting to $10.5 million were sold to meet approximately the amount required for benefit payments, and $259,000 in interest was credited to the account (table 6). Benefit payments for the month amounted to $10.4 million. Assets of the account at the end of May totaled $114 million, of which $102 million was invested in Treasury notes, $12 million in cash was credited to the disbursing officer, and $264,000 was held in the appropriation account.

Unemployment Trust Fund

State deposits in the unemployment trust fund amounted to $219 million in May (table 7). The April and May deposits totaled $262 million, $15.1 million less than the January–February deposits. The decline reflects the decrease in State unemployment contributions mentioned above. Withdrawals of $32.7 million for benefit payments were the lowest since December 1941. Since new uniform benefit years began in April in 10 States, the small amount withdrawn is particularly indicative of decreasing compensable unemployment. Disbursements for railroad unemployment benefits also continued to decline.

During May, the unemployment trust fund

Table 6.—*Status of the railroad retirement account, by specified period, 1936–42*

[In thousands]

Period	Receipts			Transfers from appropriation to trust fund	Benefit payments [1]	Assets at end of period			
	Amount appropriated	Interest received	Total			3-percent Treasury notes	To credit of appropriation [2]	To credit of disbursing officer	Total
Cumulative through May 1942	[3] $639,350	$9,981	$649,331	$639,350	$535,381	$101,500	$264	$12,186	$113,950
Fiscal year:									
Through June 1938	146,500	1,411	147,911	146,406	79,849	66,200	234	1,628	68,062
1938–39	118,250	2,202	120,452	107,094	105,774	67,200	13,206	2,334	82,740
1939–40	120,150	2,283	122,433	120,650	113,099	79,400	10,847	1,826	92,073
1940–41	[3] 113,600	2,534	116,134	124,350	121,174	74,000	2,503	10,530	87,033
1941–42 (through May)	140,850	1,552	142,402	140,850	115,485	101,500	264	12,186	113,950
1941									
May		37	37	0	10,516	84,000	49	10,831	94,879
June		2,497	2,497	0	10,343	74,000	2,503	10,530	87,033
July	140,850		140,850	46,350	10,295	107,850	94,504	15,234	217,588
August		25	25	0	10,314	101,850	94,531	10,919	207,299
September		73	73	0	10,421	91,000	94,580	11,371	196,951
October		97	97	31,500	10,496	112,000	63,103	11,350	186,452
November		124	124	0	10,357	101,500	63,128	11,592	176,220
December		156	156	0	10,699	90,500	63,160	12,017	165,677
1942									
January		176	176	31,500	10,485	111,500	31,687	12,181	155,368
February		193	193	0	10,458	101,500	31,702	11,901	145,103
March		215	215	0	10,691	91,000	31,718	11,910	134,628
April		233	233	31,500	10,776	112,000	238	11,846	124,085
May		259	259	0	10,393	101,500	264	12,186	113,950

[1] Based on checks cashed and returned to the Treasury.

[2] Represents balances in appropriation and trust fund accounts, including net credit from adjustments such as cancelations and repayments.

[3] Appropriation reduced by transfer of $9 million in October 1940 to prior-service account for collection of service and compensation data of railroad workers prior to 1937.

Source: Compiled from data in the Daily Statement of the U. S. Treasury

acquired $25 million of the same series of 2½-percent Treasury bonds acquired by the old-age and survivors insurance trust fund. Prior to May 1942 the unemployment trust fund had acquired only special obligations issued for its exclusive use. In May, the fund also acquired new special certificates of indebtedness amounting to $167 million and bearing interest at 2¼ percent. This is the lowest rate at which special obligations have been issued to the unemployment trust fund.

Table 7.—*Status of the unemployment trust fund, by specified period, 1936–42* [1]

[In thousands]

Period	Total assets at end of period	Net total of Treasury certificates and bonds acquired [2]	Unexpended balance at end of period	Undistributed interest at end of period [3]	State accounts				Railroad unemployment insurance account			
					Deposits	Interest credited	Withdrawals [4]	Balance at end of period	Deposits	Interest credited	Benefit payments	Balance at end of period [4] [5]
Cumulative through May 1942	$3,115,015	$3,106,000	$9,015	$137	$4,708,767	$157,134	$1,995,157	$2,870,744	$162,201	$5,787	$41,166	$244,131
Fiscal year:												
1936–37	312,389	293,386	94		291,703	2,737	1,000	312,389				
1937–38	884,247	559,705	12,247		747,660	15,172	190,975	884,247				
1938–39	1,280,539	395,000	13,539		811,251	26,837	441,795	1,280,539				
1939–40	1,724,862	443,000	14,862		859,864	37,524	484,764	1,693,164	44,249	202	14,552	31,699
1940–41	2,283,658	563,000	10,658		892,023	45,893	537,343	2,093,737	61,347	3,059	17,784	189,921
11 months ended:												
May 1940	1,733,220	454,000	12,220	138	847,610	17,474	431,682	1,713,943	30,944	26	13,603	19,139
May 1941	2,263,477	544,300	9,177	106	881,922	21,696	507,174	2,087,607	46,673	1,023	17,230	173,764
May 1942	3,115,015	833,000	9,015	137	1,087,408	28,880	339,280	2,870,744	56,605	2,526	8,829	244,131
1941												
May	2,263,477	137,000	9,177	106	166,135		29,017	2,089,607	863		1,088	173,764
June	2,283,658	18,700	10,658		10,102	24,197	30,169	2,093,737	14,674	2,037	554	189,921
July	2,336,948	60,000	3,948	7	77,970		28,276	2,143,431	45		366	193,509
August	2,488,016	146,000	9,016	7	175,928		24,889	2,294,470	516		487	193,538
September	2,487,541	0	8,541		7,446	55	23,670	2,278,301	16,293	5	596	209,240
October	2,541,283	59,000	3,283	33	73,654		19,408	2,332,547	78		615	208,703
November	2,712,734	168,000	6,734	33	191,377		20,203	2,503,721	845		567	208,980
December	2,744,358	26,000	12,358		12,026	28,694	28,042	2,516,399	17,288	2,510	820	227,958
1942												
January	2,775,418	39,000	4,418	18	75,307		43,104	2,548,602	96		1,257	226,797
February	2,939,810	152,000	16,810	37	202,170		37,178	2,713,594	707		1,326	226,178
March	2,923,153	−13,000	13,153		9,130	130	44,666	2,678,188	20,116	11	1,342	244,963
April	2,928,424	4,000	14,424	137	43,169		37,136	2,684,221	4		903	244,064
May	3,115,015	192,000	9,015	137	219,232		32,709	2,870,744	616		549	244,131

[1] Beginning July 1939, contains separate book account for railroad unemployment insurance account, in which are held moneys deposited by the Railroad Retirement Board and from which the Secretary of the Treasury makes benefit payments as certified by the Railroad Retirement Board. Trust fund maintains separate account for each State agency, in which are held all moneys deposited from State unemployment funds and from which State agencies withdraw amounts as required for benefit payments.

[2] Minus figures represent net total of certificates redeemed.

[3] Interest on redeemed Treasury certificates, received by fund at time of redemption but credited to separate book accounts only in last month of each quarter.

[4] Includes transfers from State accounts to railroad unemployment insurance account amounting to $105,901,000.

[5] Includes transfers from railroad unemployment insurance administration fund amounting to $11,409,667.

Source: Compiled from data in the Daily Statement of the U. S. Treasury.

Recent Publications in the Field of Social Security

SOCIAL SECURITY BOARD

U. S. Employment Service. Occupational Analysis Section. *Occupations Suitable for Women.* Washington: U. S. Government Printing Office, February 1942. 103 pp.

"This study consists primarily of a list of occupations that may offer opportunities for the employment of women in the war production program." Part I lists occupations occurring in war industries; Part II, occupations that do not occur generally in war industries. "All occupations are listed in the title and code terminology of the *Dictionary of Occupational Titles.*" Occupations not given in the *Dictionary*, or whose definitions have been revised, are defined in Part III.

U. S. Social Security Board. *Some Basic Readings in Social Security.* Prepared in the Social Security Board Library. Washington: U. S. Government Printing Office, January 1942. 74 pp. (Publication No. 28, revised.)

The fifth edition of this classified bibliography contains more than 800 titles in the field of social security, including a list of books and pamphlets in the English language on foreign systems of social insurance. Author and title indexes.

WAR AND SOCIAL SERVICES

American Public Welfare Association. *Public Welfare and War Services; A Bibliography.* Chicago: The Association, 1942. 11 pp.

Baker, Helen. *Women in War Industries.* Princeton: Industrial Relations Section, Princeton University, 1942. 82 pp.

A report on the principal personnel problems facing industry in connection with the greater employment of women in the United States and Great Britain. The special topics considered are selection and placement, induction and training, hours, wages, health and safety, and problems outside the plant, including transportation, housing, and the care of children of working mothers. A classified bibliography is included.

Butler, Harold. *The Lost Peace; A Personal Impression.* New York: Harcourt, Brace, 1942. 246 pp.

This analysis of recent European national and economic trends by the former director of the International Labor Office includes some general facts on that organization as well as conclusions on the economic and political factors essential for a stable international order. Introduction by Felix Morley.

Campbell, Douglass A. "War Hazards and Workmen's Compensation." *Journal of the State Bar of California*, San Francisco, Vol. 17, No. 3 (March–April 1942), pp. 95–105.

Discusses the principles involved in a variety of risks due to military action abroad, with references to similar examples in this country.

Comstock, Ada L. "Women in the War." *Yale Review*, New Haven, Vol. 31, No. 4 (Summer 1942), pp. 671–682.

Includes comments on women in the labor market, and on nutrition and other problems.

Ellis, William J. "War Services of Community Agencies." *State Government*, Chicago, Vol. 15, No. 4 (April 1942), pp. 81–82 ff.

Emphasizes the viewpoint that in the war effort governors and members of State legislatures should use not only volunteer organizations but also the existing public welfare groups.

"Establishment of National Selective Service in Canada." *Labour Gazette*, Ottawa, Vol. 42, No. 4 (April 1942), pp. 402–427.

A documentation of recent Canadian developments, including Parliamentary addresses, other official statements, and orders in council.

"From Peacetime to Wartime Jobs." *Vocational Trends*, Chicago, Vol. 5, No. 4 (April 1942), pp. 4–5.

Briefly reviews the types of conversion whereby workers are transferred to the task of rearmament, and gives a listing of such job shifts taken from the USES Job Family studies.

Harrison, Shelby M. *Attacking on Social Work's Three Fronts.* New York: Russell Sage Foundation, 1942. 30 pp.

The President's address at the 1942 National Conference of Social Work states the creed and problems of democratic social work in three areas—"direct service in the immediate war effort," "the day-by-day performance of social work's essential duties," and "the whole broad field of postwar reconstruction."

Haupt, Alma C. "The Government's Subcommittee on Nursing." *Public Health Nursing*, New York, Vol. 34, No. 3 (March 1942), pp. 147–154.

Describes the organization of nursing in national defense, with special references to the official Subcommittee on Nursing of the Health and Medical Committee of the Office of Defense Health and Welfare Services. Includes an organization chart, a consideration of proposed means for meeting the nursing personnel problems, and a discussion of the problems of providing various types of service.

Hertel, Frank J. "Case Work Services Offered by Family Agencies." *The Family*, New York, Vol. 23, No. 4 (June 1942), pp. 129–134.

In addition to surveying such specialized services as those relating to nutrition, budgeting, and debt, the author notes the work of family agencies in the wartime

fields of special unemployment, migration, evacuation, employment of mothers, and military service.

HINRICHS, A. F. "Occupational Outlook and the War." *Occupations*, New York, Vol. 20, No. 7 (April 1942), pp. 499–505.

An address by the Acting Commissioner of Labor Statistics on the forecasting record of the Occupational Outlook Service of the Bureau of Labor Statistics.

JETER, HELEN R. *Separation Allowances to Families of Men in the Armed Forces of the United States.* Washington: Office of Defense Health and Welfare Services, 1942. 10 pp. Processed.

A committee paper from the 1942 National Conference of Social Work which gives sone principles of wartime family allowances and discusses measures proposed in the spring of 1942.

MACLEAN, BASIL C. "Hospitals Now and After the War." *Hospitals*, Chicago, Vol. 16, No. 6 (June 1942), pp. 13–18.

Includes comment on "the desire of the Social Security Board to extend tax legislation to provide payments for hospital care."

MCCONNELL, BEATRICE. "Wartime Employment of Children and Youth." *Labor Information Bulletin*, Washington, Vol. 9, No. 5 (May 1942), pp. 8–10.

Contains several statements of governmental policy for maintaining safeguards for the health and welfare of young persons without impeding essential production.

MCELROY, RUTH A. "Wartime Need for Day Care of Children." *The Family*, New York, Vol. 23, No. 4 (June 1942), pp. 123–129.

Some results of a survey in New Haven, Connecticut, showing an emphatic need for day care of children of employed mothers.

MCNUTT, PAUL V. "Health Agencies—Their Responsibilities and Their Opportunities During the Present Crisis." *Public Health Reports*, Washington, Vol. 57, No. 19 (May 8, 1942), pp. 685–691.

MCNUTT, PAUL V. "Mobilizing Manpower." *American Federationist*, Washington, Vol. 49, No. 5 (May 1942), pp. 3–4.

"Mobilization of Manpower." *Indiana Law Journal*, Indianapolis, Vol. 17, No. 4 (April 1942), pp. 351–358. (Notes and Comments.)

Discusses the reasons for manpower mobilization and gives general comparisons with the systems used in other countries.

NATIONAL INDUSTRIAL CONFERENCE BOARD. *America's War Effort; Objectives, Resources, Progress.* New York: The Board, 1942. 28 pp. (Conference Board Reports.)

Summarizes, by charts and brief text, the principal facts in the American war effort, as of May 1942. The labor force, employment trends, expenditures, living standards, and population groupings by age, occupational status, and industrial employment are discussed.

NATIONAL INDUSTRIAL CONFERENCE BOARD. *Employee Thrift Plans in Wartime.* New York: The Board, 1942. 40 pp. (Studies in Personnel Policy, No. 42.)

Describes various thrift plans as developed by 252 firms, and notes experience under each type. Programs discussed include the sale of United States war bonds to employees, credit unions, savings plans in connection with banks, company savings plans, pooled savings and investment plans, and employee stock-purchase plans.

"The Negro's War." *Fortune*, New York, Vol. 23, No. 6 (June 1942), pp. 77–80 ff.

A review of the Negro in the Nation's labor market, with data on governmental, employer, and union attitudes and practices.

"The New Canadian Man-Power Programme." *International Labour Review*, Montreal, Vol. 45, No. 6 (June 1942), pp. 672–676.

PARRAN, THOMAS. "Opening Remarks to the Fortieth Annual Conference of the United States Public Health Service With the Conference of State and Territorial Health Officers." *Public Health Reports*, Washington, Vol. 57, No. 19 (May 8, 1942), pp. 691–696.

A review of wartime public health problems, with particular reference to State administration.

PIERSON, HARRY E. "Relief and the War; Nationwide Trends Analyzed." *Tax Digest*, Los Angeles, Vol. 20, No. 3 (March 1942), pp. 84–86.

Considers the defense training programs of Federal agencies, public assistance trends, and WPA financing.

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"State and Territorial Health Officers Confer on Wartime Tasks." *Public Health Reports*, Washington, Vol. 57, No. 19 (May 8, 1942), pp. 696–707.

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The first of these pamphlets describes "the basic research approaches to the major types of problems with which chests and councils are concerned," with illustrative material on the research procedures of community chests in five cities. Chapters are devoted to identifying research problems, relating them to a community plan, choosing research methods, shaping plans for action, and administering research. The publication on *Statistical Aids* outlines the problems of community welfare under the headings Dependency, Behavior and Social Adjustment, Health, and Leisure Time. Available statistics for the country and for urban areas are given, together with reference lists of statistical source material in each field.

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Some findings of a Philadelphia County survey made in August 1941, during which all recipients of general assistance were interviewed as to future eligibility for aid.

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Under a resolution of the Pennsylvania State Board of Public Assistance, unattached able-bodied employable persons between 20 and 40 years of age became ineligible for general assistance on July 16, 1941. This survey shows the success of a 17-percent sample of these persons in finding employment after a three-month interval.

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Statistical data concerning 2,128 Indiana children, most of whom were committed by the courts as public wards during 1941.

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Four suggestions for reducing industrial accidents.

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Data on assets, liability, income, and expenditures of each of the 60 member associations of the American Hospital Association.

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U. S. GOVERNMENT PRINTING OFFICE: 1942

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[Reprinted from THE WOMAN WORKER, bimonthly publication of Women's Bureau
U. S. Department of Labor, Washington, ~~March~~ May 1942]

Women on the Battle Line in War Factories

EMPLOYMENT of women in war plants is increasing rapidly. However, many women are unemployed because industries are being converted to war work. Large numbers of women are seeking employment, both at employment offices and at plant gates. Hence a general registration of women is not necessary at this time. In some areas with acute labor shortages, local registration may be of advantage.

HALF a million women were estimated early this year to be serving their country in war industries. The number of these increases day by day. In some 30 plants making small-arms and artillery ammunition, where 40,000 women were employed in the last quarter of 1941, over 70,000 are expected to be at work by late summer. In some of these the woman labor force will be doubled, in others trebled, and some will employ 10 times as many women as before. These are chiefly new jobs, not those vacated by men. Before 1941 almost no women were in aircraft.

Women in Jobs Vacated by Men

Many reports from all parts of the country show that men called to war service actually have been replaced by women in types of work formerly not done, or done only very rarely, by women, though of course there is no way to discover the full number of these. They include clerks, cashiers, and pharmacists in drug stores, theater ushers, hotel elevator operators, taxi drivers, bank tellers, electricians, acetylene welders, milling-machine operators, riveters, tool-keepers, gage checkers, gear cutters, turret and engine lathe operators. Women are operating service stations. They are replacing men as finger-print classifiers. A southern city reports a woman manager of a parking lot.

One of the country's major airfields has women on maintenance work, engaging them chiefly in cleaning spark plugs and painting luminous dials. One woman hired as a secretary now directs landings and take-offs by radio. In another city a woman has entered for the first time an airfield office as a meteorologist. Both an eastern and a southern airport have definite plans to place women in their reservations departments, and in flight watch or in the traffic operations departments, and the Civil Aeronautics Administration is considering training women as radio operators.

Women telegraph messengers now number 325 in New York City alone, and in the country as a whole 3,000 women are expected to do such work this year. In New York, they must be at least 21 years of age. Girls also are performing other messenger service, formerly done by boys, in many plants and offices. A major chemical company is now training a few women as its chemists.

Labor Shortages Open Jobs to Women

There are many types of work long done by women but in which women now are being taken on in large numbers, because of plant expansion as well as declining supply of male labor. For example, as armature winders, inspectors, power-press and drill-press operators, assemblers. Shortages of workers are reported in many places in fields usual for women; for example, in hotel and restaurant work, as retail clerks, stenographers, and as sewing-machine operators in certain great clothing centers. Shortages of school teachers are growing, because of better-paid jobs in industry as well as the drafting of men, and the National Education Association reports that the enrollment in teachers' colleges and normal schools has declined by 11 percent. Certain of the army camps already have employed considerable numbers of women in their offices and laundries, jobs formerly done

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by men but of a type frequently performed by women. A woman's job at present done by men in camps is canteen work, but serious consideration is being given to employing women in this.

Unemployment of Women

Contrary to the movement of women into the manufacture of war products, and into jobs being vacated by men, runs that opposite line of women losing jobs due to curtailment of civilian goods and of critical materials. Such "priorities unemployment" became acute at certain points in the second half of 1941. Plants making many of the products curtailed employed large numbers of women—as on aluminum kitchenware, refrigerators, silk hosiery, washing machines, radios, typewriters, photographic supplies, metal toys, costume jewelry, slide and snap fasteners, and so forth. Others depend on equipment now curtailed, as for example the apparel industry threatened with shortages of steel needles and consequent danger of unemployment. In many cases it takes longer to place women than men in new jobs, since their industrial experience is less similar to the new types of work required. Moreover, some of these products are made in localities that offer women little chance of other plant jobs.

Women's Pay Rates in War Plants

In aircraft assembly plants, minimum entrance rates were the same for women as for men in 15 of 17 major plants visited by Women's Bureau agents in December 1941 or January 1942. Eleven of these, employing 90 percent of the women in the 17 plants, had entrance rates of 60 cents an hour, with progression to 75 cents after 3 months' experience. In two plants the entrance rate for women was 65 cents, in one 55 cents, in three 50 cents, and only in two of the last named was the rate higher for men (55 and 60 cents). In seven plants where women were at work on the second shift, they received from 5 to 8 cents an hour more than on the first shift.

Women's Bureau visits have ascertained the standards as to women's wages in a dozen plants making small-arms and artillery ammunition. The operations involved are chiefly such as long have employed women. Nearly all these were new plants or they were making new products and the labor force in each included many women. In two-thirds of these establishments the entrance rate for women ranged from 40 to 48 cents an hour; in the remainder it was above this, running as high as 59 cents in one new plant with a relatively small number of women. In the two old plants not making new products women had entrance rates of respectively 45 and 46 cents. Unlike the situation in aircraft, hourly entrance rates for men were the same as for women in only one plant, at least 10 cents above in the others reported. In two plants the men's entrance rates were 75 and 80 cents, respectively 20 and 22 cents above those for women.

Eleven plants reported employing women on a second shift; eight of these also had a third shift. Six of nine reporting on rate paid extra, usually 5 percent an hour more on the second shift, with an addition of up to 10 percent for the third shift. One plant paid a 10-percent differential on both second and third shifts. Three of these plants, and two that had not yet added shifts, were following the plan to alternate workers without extra pay.

U. S. GOVERNMENT PRINTING OFFICE: 1942

March 5, 1942

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

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PRIORITIES FOR WOMEN AS A WAR LABOR SUPPLY

Statement by Mary Anderson, Director
Women's Bureau, U.S. Department of Labor

Authorities agree that the coming months will bring an unprecedented demand for women as workers in war industries. To meet this growing need there is a large reservoir of woman labor to be drawn on. To develop sound policies as to the most effective use of such forces, and to prevent serious social and economic disruptions, employment priorities in regard to several classes of women should be established. During abnormal war conditions, it is essential to control the use of the Nation's resources - its woman labor supply as well as its manpower, raw materials and machines.

Naturally the primary basis for selection of employees is such job qualifications as training, experience, and aptitude. In the rapidly expanding production program recruitment of many women not now in the labor market may become a definite procedure in various localities. Therefore, I recommend that the several classes of women be drawn on for industrial employment in the following order:

1. The first women to be hired for war jobs are those who become disemployed as a result of curtailed or converted industries. These workers, because of their industrial experience, can be quickly adjusted with a minimum of training. Moreover they are already a definite part of the country's labor force and have need to earn a living for themselves and in many instances for dependents as well.

2. The second classification of women to be considered as readily available for war production is also a part of the present labor force. This group comprises those registered in public employment offices as applicants for jobs.

Among these are women of different age and marital status and of varied qualifications. Some are women in their forties or fifties who have had valuable industrial experience and could, after a refresher course, be employed on more or less skilled operations. Others are young women who are entering the labor market for the first time and though without mechanical skills could, after a short training period, be adapted to the simpler processes on production lines.

3. Types of women who could be advantageously recruited as workers if and when needed are widows of soldiers and married women whose husbands are in the draft and other housewives who have no small children. Some of these women have had industrial experience.

4. Mothers of small children should not be recruited unless there is a much more serious labor shortage than is now envisioned. Even though nursery schools or day nurseries were provided to care for the children of employed mothers these women would be forced to carry a double burden. Their health and efficiency as workers would be undermined by their need to do two jobs - one in the factory , the other in the home, caring for their children before and after work, preparing their meals, taking them to and from the nursery, and so on.

Though I do not advocate putting up actual barriers against employment of such mothers, since in some cases they may need to work and can provide satisfactory care for their children, I do advise against any effort to recruit them until all other sources of labor supply in a community have been fully utilized.

Most mothers prefer to remain at home to look after their children. In this time of crisis there is no finer contribution such women can make.

March 4, 1942

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

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Authorities agree that the coming months will bring an unprecedented demand for women as workers in war industries. To meet this growing need there is a large reservoir of woman labor to be drawn on. To develop sound policies as to the most effective use of such forces, and to prevent serious social and economic disruptions, employment ~~priorities~~ policies in regard to several classes of women should be established. During abnormal war conditions, it is essential to control the use of the Nation's resources - its woman labor supply as well as its manpower, raw materials and machines.

Naturally the primary basis for selection of employees is such job qualifications as training, experience, and aptitude. In the rapidly expanding production program recruitment of many women not now in the labor market may become a definite procedure in various localities. Therefore, I recommend that the several classes of women be drawn on for industrial employment in the following order:

1. The first women to be hired for war jobs are those who become disemployed as a result of curtailed or converted industries. These workers, because of their industrial experience, can be quickly adjusted with a minimum of training. Moreover they are already a definite part of the country's labor force and have need to earn a living for themselves and in many instances for dependents as well.

2. The second classification of women to be considered as readily available for war production is also a part of the present labor force. This group comprises those registered in public employment offices as applicants for jobs.

Among these are women of different age and marital status and of varied qualifications. Some are women in their forties or fifties who have had valuable industrial experience and could after a refresher course, be employed on more or less skilled operations. Others are young women who are entering the labor market for the first time and though without mechanical skills could, after a short training period, be adapted to the simpler processes on production lines.

5. Types of women who could be advantageously recruited as workers if and when needed are widows of soldiers and married women whose husbands are in the draft and other housewives who have no small children. Some of these women have had industrial experience.

6. Mothers of small children should not be recruited unless there is a much more serious labor shortage than is now envisioned. Even though nursery schools or day nurseries were provided to care for the children of employed mothers these women would be forced to carry a double burden. Their health and efficiency as workers would be undermined by their need to do two jobs - one in the factory , the other in the home, caring for their children before and after work, preparing their meals, taking them to and from the nursery, and so on.

Though I do not advocate putting up actual barriers against employment of such mothers, since in some cases they may need to work and can provide satisfactory care for their children, I do advise against any effort to recruit them until all other sources of labor supply in a community have been fully utilized.

Most mothers prefer to remain at home to look after their children. In this time of crisis there is no finer contribution such women can make.

Reprinted from THE WOMAN WORKER, bimonthly publication of Women's Bureau
U. S. Department of Labor, Washington, March 1942

Building Woman Power Important to Defense

"Women have proved indispensable to war production in England, and we must prepare to expand their usefulness to our industries", stated Sidney Hillman, in charge of labor supply and training in the new War Production Board.

"The Government will expect a gradual but constant substitution of women in industry and agriculture for men who are fit to fight", according to Brig. Gen. Lewis B. Hershey, National Selective Service Director.

Among types of work in which the Employment Service reports labor already short, and which women can perform or be trained to perform, are drill-press operation, mechanical-instrument making, semiskilled grinder operating, heat-treating occupations, core making, radio assembly, arc welding, riveting, air-frame assembly, fabric work, inspecting, lens grinding, coil winding and coil assembly, and occupations in making optical goods, clocks and watches, and electrical equipment. In England women do effective work operating machines for which shortages are reported here, such as engine and turret lathes and boring and milling machines.

Women Making Instruments for Defense.

The lack of a uniform policy in the employment and training of women is shown clearly in a recent Women's Bureau study of women workers in the manufacture of instruments.[1] In 3 plants that employ women on a variety of operations and in relatively large proportions, the most open-minded attitude toward increasing women's employment was found. In most plants, though much of the work is light and little is beyond the physical ability of women, prejudice on the part of management is hedged against them. The proportion of women in the 17 plants visited ranged from 3 to 50 percent, and their number from 6 to nearly 1,400.

Only two plants had courses of study and specific training programs, and in one of these only men had been admitted because the training was part of an up-grading plan and the policy was to restrict women to unskilled repetitive work. In all other plants, training was on the job. Many beginning jobs in machine shop, assembly, and inspection sections are closed to women because these operations are regarded as the beginning step for young boys.

From the survey it was clear that women could do part or all of certain jobs now done only by men. Their proportion could be increased, often extensively, on jobs now done by both men and women. This is the over-all picture of the 17 plants. In some, women were working satisfactorily on machine and assembly operations for which, in certain other plants, women have not even been considered. Though most of the plants have not offered any special training to women for job progression and up-grading, have not tried to give them training or responsibility for set-up of machines, and have limited their work to unskilled repetitive tasks, the generalization often is made that women have no mechanical ability, interest, or aptitude. In a few plants where they are allowed to do so, some women set up their machines, a responsibility of many women in British factories.

Women Take Part in Making Airplanes.

Airplane plants are taking women in small but increasing numbers. Late in 1941 the Women's Bureau received reports from several plants that when visited in the spring

[1] Women's Bureau. The Employment Of and Demand For Women Workers in the Manufacture of Instruments—Aircraft, Optical and Fire-Control, and Surgical and Dental. November 1941.

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had few or no women on production. For one plant the recent report shows 350 women now employed, for another plant over 500. There are in operation 60 plants doing airplane assembling, 70 making parts and accessories, and 11 making engines. In the 26 principal assembly plants about 2,300 women were on production work last November, an increase of 19 percent from October. In 17 of these there either were no women or women were less than 1 percent of the labor force, but in 4 others from 5 to 10 percent of the productive workers were women, and in 2 plants women comprised 12 and 15 percent. A recent British report states that in that country the aircraft industry is 30 percent staffed by women and that this could be increased to 70 percent.

Most women have been on sewing or in the fabric departments, but Women's Bureau studies and other data show that women can be employed in almost every production department with only short training periods. In several large plants women now are on production jobs throughout the plant. In a large midwestern plant, for example, women in the sheet-metal department operate drill presses, hand drills, and other machines. They also work on assembly of oil and gas lines, do all types of bench work, and install the radio in the plane. In the woodworking department women operate band saws, sanding belts, and do nailing and gluing of small wooden parts in jigs—in fact, do all work on smaller sections later assembled by men. At the special request of this plant, national defense training courses in woodworking were given to women. Minimum pay rates are 60 cents an hour, the same for women and men.

Elsewhere, a large plant introduced women first in cutting and sewing, later placing them in most of the other departments, processes being so simplified under the quantity-production schedule that little training was needed. Time required for the job of assembling electrical parts and wiring had been greatly reduced. Women now work in the machine shop, and even on final assembly, where a powered conveyor line is used. Fuselage frames are so carried as to give an unobstructed floor and allow work to be done from a normal position. The fact that almost 90 percent of these women had had manufacturing experience, including work on radios, phonographs, plastics, and many small-machine operations, shows the possibilities of placing women unemployed through priorities.

The policy announced by another plant in hiring women is to take first single women, married women with husbands in the armed forces, widows, and those with husbands unable to work. Second consideration is given women with husbands in gainful work.

Conference on Women in War Industries

A JOINT conference of the Women's Bureau Advisory Committee and the Bureau's Labor Advisory Committee was held late in January to discuss the employment of women in war industries and services. The Conference separated into committees to consider various aspects of the problem. The reports of the committees were accepted as the consensus of the conference members and were referred back to be considered and acted on by the various women's and labor organizations represented. The conference planned for continuing committees and future sessions of the entire group. Among major recommendations of the committees were:

War Industries' Need of Women.

This committee recommended a training program for women that does not stop with immediate placement, but includes supplementary training to give opportunity for upgrading. It urged inclusion of women on policy-making bodies in the war-production program as well as in the enforcement of such policies.

Office Workers in the Defense Program.

This committee recognized that the defense program will need to transfer office workers to localities new to them, and that

this can be efficiently handled only if these workers are protected in job security and wage standards. Basic to this is better classification of office jobs in relation to wage rates, with the same pay for women as men on the same work. Efficiency in an all-out production program demands special efforts to maintain the health and efficiency of this type of worker, who is subject to particular nervous tensions.

Need for Women in Professions.

This committee pointed out that the present emergency is creating a shortage of women trained along the lines in which professional women can be of service in industry, owing to the fact that too few are so trained and to lack of a central agency that should know of trained women and of needs for them. Women personnel directors and dietitians in war factories were urged, as were women officials in the Employment Service to determine policies as to women's work in war industries.

Labor Standards for Women in War Work.

This committee recalled the President's warning that on production rests the fate of the United Nations, and again pointed out what has been proved repeatedly—that only by observing the standards that preserve the workers' physical fitness can production be increased. (See p. 6 for such standards.) If temporary emergencies demand somewhat lower standards, these should be allowed only through State labor departments, after investigation and for a limited time, and to none but war industries.

The Community and Women War Workers.

This committee recommended that women's organizations in various defense areas call women's needs to the attention of proper authorities in the community, and help to see that women's needs are included in adequate community planning for housing, eating facilities, transportation, and recreation.

Statement of War Policy as to Labor Standards

THE Army, the Navy, the Department of Labor, and Labor Commissioners of some 15 of the more important industrial States represented at a Conference called by the Secretary of Labor in Washington in January have agreed to the following basic labor policies as necessary for efficient defense production:

The President has said that unrelenting production is the price of peace with victory and to this end he has ordered all war facilities to proceed immediately on a 24-hours-a-day, 7-days-a-week production basis. Time is short, and the President's command must be complied with now.

The challenge to our freedom can and must be met at once by heroic efforts on the part of management, labor, and Government. Wherever and whenever local labor markets are exhausted, and pending conversion of nondefense machine capacity and workers and the training of new workers, men and women now on the job must keep every machine running continuously regardless of the sacrifice entailed.

Shortages in available labor in the critical days ahead require relaxations in accepted standards. But every effort should be directed toward shortening the period during which all-out production is dependent upon continuance of these relaxations. Industry must convert machinery and recruit and train labor as fast as humanly possible to assure early return to sound labor standards which over any protracted period are essential to the maintenance of maximum production. Any other policy would be shortsighted, since ultimately the quality and quantity of our production would be seriously impaired. These standards are the mechanisms of efficiency. Industrial history proves that reasonable hours, fair working conditions, and a proper wage scale are essential to high production.

The grim period of adjustment will be short because management, labor, and Government will cooperate. To this end management must immediately institute plant training and up-grading of workers. Labor must intensify its efforts to make this training successful. Government must expand and coordinate its training programs to increased labor supply.

All labor resources should be utilized to their maximum efficiency, and in particular full use made of all qualified local labor. The United States Employment Service is the official recruiting agency for industry. Management and labor have been specifically requested to use to the fullest Public Employment Offices and should comply with this request. To this end Federal and State authorities must devote their entire energies, giving intelligent guidance and effective coordination to, and where necessary, supplementing the efforts of industry.

This all-out program of production requires the employment of all labor in accordance with those practices which will result in the maximum continued output of every individual. The sole test of labor standards must be the effect on the efficiency of the individual to insure top war production. Based on this test the State laws and regulations embracing the following basic principles should be preserved except where modification may be necessary during the war period to assure maximum production:

(1) A maximum 48-hour week, since weekly hours in excess of this standard have been demonstrated to result in decreased rather than increased production when continued for any extended period of time.

(2) An 8-hour day, or the daily hours customarily worked in the particular establishment, industry or community.

(3) One-day-of-rest-in-seven, because experience has shown that this interlude has a revitalizing effect on the worker and a consequent beneficial effect on the total output.

(4) Adaptation of the hours of labor and working conditions to the age and sex of the worker and the nature of the occupation.

(5) Provision should be made for adequate meal and rest periods from continuous work in order to preserve health and efficiency.

(6) Proper safeguards for health and safety go hand in hand with production efficiency and, therefore, greater care must be exercised in making plant conditions safe and healthful.

(7) Wage rates for women should be the same as for men, including the entrance rate.

These standards must be relaxed if and when necessary for total war production. There must be no relaxation of standards governing employment of minors under the age of 16. At the same time there must be vigilance to prevent any unnecessary abrogation or suspension of labor laws and regulations. There is no occasion to engage in a blanket suspension of labor standards. It would be unwise to sacrifice, where sacrifice is not required, the safeguards with which the country has sought to protect labor. Social gains, not inconsistent with war needs, must be conserved.

Present Legal Standards for Manufacturing.

In manufacturing, 21 States now provide a maximum of 48 hours or less for at least some workers; 9 of these can permit longer hours in emergencies. Twenty States have 1-day-of-rest-in-7 laws, 10 of which can be suspended in emergencies; all other States but 4 have laws in general prohibiting Sunday work. Twelve States have laws or orders prohibiting night work for women in manufacturing during certain hours; most of these laws or orders allow relaxation for emergencies.

U. S. GOVERNMENT PRINTING OFFICE: 1942

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Women Workers at the Turn of a New Year

"THE months ahead will increasingly throw into relief the role of the woman worker in defense industries. Every effort must be made to point out the occupations for which she naturally is well qualified, to train her for her work, and to enable her to find her best place. As a bulwark of national strength, her health and well-being must be adequately safeguarded, both by the proper facilities on the job and by assuring her a suitable living place and recreational opportunities."

Such is the direction pointed by Mary Anderson, Director of the Women's Bureau, to forge in 1942 a vital link in the chain of democratic life. How strong it can be made depends partly on what the impact of defense in 1941 has meant to women workers—in employment, unemployment, types of jobs, growth or relaxation of healthful work standards. Their wage gains in the year are pointed out elsewhere in this issue.

Unemployment Due to Priorities

Women are prime sufferers from dislocations caused by shifting to a defense economy. In Great Britain women's unemployment continued to increase for many months after England was at war.

In this country, 1941 closes with uncertainty among women in the employment scene. New demands for workers on the one hand, scattered in location, are met on the other hand by a swell of unemployment arising from defense priorities and shortages of materials. Often this occurs in plants that employ many women, as in the making of aluminum kitchenware, refrigerators, washing machines, radios, rubber products. These products frequently are made in places where workers have little chance of other jobs.

Vigorous efforts are being made to relieve this situation by plans for reemployment of the workers, such as those thrown out of work in silk mills, including thousands of women. Particular attention has been paid to allocating defense contracts to plants suffering from curtailment, the first industry-wide case applying to plants making washing machines. But inevitably there is much intervening hardship for workers and thousands of women have been affected in many States, for example, Ohio, Pennsylvania, and North Carolina.

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Elsewhere, Many Women Find Jobs

Considering all parts of the country, totals stacked up to increases in women's employment month by month, beginning early in 1941. Late fall figures are not yet available to gage the extent to which priorities unemployment now has cut into these increases. At first the new jobs for women in defense plants were largely in operations long performed by them. Shortages of textile and sewing-machine operators, for example, have been reported over and over from many areas. But more and more as the year advanced women were reported on production jobs formerly done chiefly by men. In one aircraft plant, for example, some women are operating light rivet guns, drill presses, and turret lathes; spray painting; installing fittings and equipment in fuselages on the power assembly line; wiring; spot and arc welding.

Defense employment has been concentrated in certain industrial States. A recent report shows nearly two-thirds of the new needs late in 1941 to be in five States, some of which have suffered from marked unemployment due to priorities—California, Michigan, New York, Ohio, and Pennsylvania.

However, special efforts have been made to spread defense plants more widely into certain formerly nonindustrial areas, and there have been many scattered instances of women called to such jobs in considerable numbers—for example, in Iowa, Colorado, Virginia. In the Elwood ordnance plant in Joliet, Ill., hundreds of women are reported to be loading shells; in Elkton, Md., and nearby towns of Aberdeen, Md., and New Castle, Del., munitions work employs well

over 3,000, largely women; in St. Paul, Minn., an ammunition plant to open shortly will have a labor force of an estimated 8,000, 40 percent of whom will be women.

Occupations for which particular shortages of workers were reported near the end of the year include some work that can be done by women—for example, drill-press operating, aircraft riveting, and inspecting are in great demand.

Outside defense plants proper, women's chances have ballooned in types of work formerly done by them. The cry of shortages of competent stenographers and office-machine operators, as well as domestic and other service workers, is widespread. Early last summer the Civil Service Commission appealed to all Federal agencies to employ women in more positions. In a sample of department and specialty stores surveyed by the National Retail Dry Goods Association, over 40 percent of the male personnel are of draft age. The survey listed many departments in these stores where women could be substituted.

Work Conditions Improve in 1941

The major advances in the past year toward improved conditions for women defense workers include: (1) Wage increases; (2) growth in the social security program; (3) important surveys of the conditions of women's employment, with recommended standards for their work; (4) growth in trade-union membership and agreements. Wage increases for many women and greater wage safeguards have resulted from new and revised orders, both State and Federal, discussed elsewhere in this WOMAN WORKER; from a few court decisions; and from many union agreements.

The Women's Bureau served during the year as consultant for various defense and other agencies, undertaking special investigations or other major work at their request. These include the War Department, Office of Production Management, Office of Education, National Youth Administration, State departments of labor, private industry, and union groups concerned with specific problems of women on defense production. The Special Labor Advisory Committee on women's defense work, formed last year by the Bureau, also has been active.

The Bureau has specially investigated and analyzed women's role, present and potential, in defense industries such as aircraft, small arms and artillery ammunition, and instrument making. Earlier recommendations as to health practices in employing women have been followed by detailed suggestions for providing safeguards where heavy weights must be lifted, and as to protective clothing for women in defense work.

Though 43 States held regular legislative sessions in the year, major changes in basic wage or hour laws were few. Labor laws affecting women in defense industry were relaxed somewhat in Massachusetts and Nebraska, where work hours possible for women were pushed on to a later evening period, and Connecticut, where the 9–48 hour law in manufacturing was amended by authorizing the Governor, in the interest of national defense, to permit 10 hours a day, 55 a week, for more than the 8 weeks already permitted in emergencies. Special mention should be made of an enactment in New Jersey barring discrimination against women in public employment because of sex or marriage.

FOR THE successful carrying out of our program for the production of vast quantities of explosives and propellants, as well as shell loading, the women of America must be given credit, on account of the highly important part they took in this phase of helping to win the war * * *.—*Assistant Secretary of War Benedict Crowell in 1919.*

Supply of Women Can Swell Defense Labor Ranks

As LONG as there are millions of women outside the usual labor force who can be drawn into defense employment, the worker's hours should not be lengthened unduly. Moreover, excessive work hours actually reduce production, as has been proved over and over in industrial experience here and in England and elsewhere.

Thus an available woman labor supply can help to maintain standards already reached for reasonably short hours of work, and also to keep up production standards. Indeed the present outlook shows a potential labor supply well in excess of the apparent need.

Numbers of Women Reserves.

The number of women who can be called on may be estimated in different ways, and might easily range from 2 million to 7 or even 8 million, depending on extremity of the emergency. According to the 1940 Census, the numbers of women in the country who are less than 45 years old are distributed as to work status about as shown below. The summary does not include women of 45 and over, because probably as many of these would leave jobs as would newly enter defense employment.

	Millions of women aged 14 to 44	
In total population		33.2
Not in labor force		23.1
In labor force, total		10.1
Employed:		
Other than public emergency work	8.7	------
Public emergency work	.3	------
Seeking work:		
Experienced	.8	------
New workers	.3	------

If the 23 million women under 45 not in the labor market are recruited for defense labor in about the same proportion as all women now in the labor market (25.5 percent), 6 million could be called on.[1] Applying to the United States the estimate of one British economist, that about half the woman population of Great Britain could be employed, would give a figure of approximately 6½ million for the additional women under 45 available in this country. Both larger and smaller estimates have been made. Of course, not all these could be newly recruited within any single year.

How Soon Could These Women Go to Work?

How quickly could defense need call out the services of women not now on the job? Those now "seeking work" and those employed in the emergency-work program could be placed as soon as wanted, so far as readiness to accept a job is concerned. However, defense demands are highly concentrated geographically, and women constitute a less mobile labor force than men. Moreover, there would have to be reasonable wage inducements for some of these women to enter defense work. With women as with men, the more capable workers frequently are the more difficult to secure. The British Ministry of Labor last February introduced a plan for "settling-in grants," making transfer to defense jobs easier. In certain cases workers who transfer from a distance to take work of national importance may be paid this small grant at the end of the first week. At the end of the second week, women transferred workers (and only women) may receive an added small amount.

How Many Workers Are Needed?

A recent statement of O. P. M. indicated that 2 to 3 million more workers would be required in defense plants within a year. Through 1944, as estimated by the National Resources Planning Board, there would be only about 6½ million additional workers needed in the labor force. Only 2½ to 3 million workers could be absorbed by industry in any one year, according to the N. R. P. B., with possibly a peak of 4 million in a maximum year.

[1] Of course efforts to recruit women would omit those with small children unless a very extreme emergency should arise. About 12½ million families have children under 10. Mothers of an undeterminable number of these already are in the labor market, or are over 45 years of age. Hence probably well over 11 of the 23 million are not kept from gainful work by care of small children.

The Bureau of Labor Statistics has estimated that the defense appropriations and contracts authorized by about mid-1941 would require 19 million "man-years" of work; at the date of estimate 4 million employees were on defense work. However, much of this is to be spread over several years, so that even with added contracts the possible labor force is sufficient.

Besides the women who can be called to work, another group exists that can be used to add to production before new workers need to be recruited—the available men and women now working only part time, a number amounting to over 8 million last April. Moreover, many workers will postpone retirement during the emergency. Add, too, the fact that in the months prior to estimates culminating about now, the number of workers actually on jobs did not increase so much as expected.

Labor Supply More Than Sufficient.

On any sound basis it is highly conservative to say that available women added to other available workers (men and the underemployed) would much more than take care of the requirement, without lengthening hours, and would do so even if the production of some individuals should be somewhat below normal. Before considering longer hours for the worker, machines should be put fully to work, with two or three shifts of 8 hours (where State law permits).

Adjustments to Secure Needed Skills.

So much for quantity of labor, but what about necessary skills? Obviously, men and women not having these must be given training, and this at once, since learning the more skilled work requires time. Side by side with such a program goes the extension of two other moves that long have been in progress in planning for greatest industrial efficiency: (1) The splitting up of some of the more skilled processes so that persons with less training can do them, and (2) the grading upward of workers as fast as their experience and ability enable them to do a more complicated job.

Shifting the Supplies of Labor.

The more social aspects of the labor-supply question have been left out in the foregoing discussion, and serious types of dislocation in the labor market already are coming to the fore. Lay-offs are occurring due to defense priorities or to shortages of materials, causing an extensive shifting of workers into new jobs, with the hardships of more or less intervening unemployment.

U. S. GOVERNMENT PRINTING OFFICE: 1942

WB

Government-agency source for estimates on employment of women

Total woman employment

Jan. 1942 - 12,100,000. WPA project "Estimates of Employment and Unemployment" [This project now transferred to Bureau of the Census]

Aug. 1942 - 14,100,000. See above.

Dec. 1942 - 15,000,000. U.S. Women's Bureau estimate, based on increase during the year to date.

Dec. 1943 - 18,000,000. War Manpower Commission, Release of July 17, 1942.

War Employment of Women

Jan. 1942 - 500,000. Testimony of Thelma McKelvey, Labor Supply Division, War Production Board, before Tolan Congressional Committee on Defense Migration, Feb. 1942. [This labor supply division now in War Manpower Commission]

Aug. 1942 - 2,500,000. U.S. Women's Bureau estimate, based on War Manpower Commission release on number employed in spring and number employed in January.

Dec. 1942 - 4,000,000. War Manpower Commission (statistical division)

Dec. 1943 - 6,000,000. See above.

Telephone conversation by RFN with Emmet Welch, Statistical Division, War Manpower Commission, Sept. 16, 1942.

Aug. 1942 - Women comprise 20 percent of total persons in war work (according to all available information at hand).
But women's proportion of labor force in war work will be increasing - can expect it, even, to reach at least 25 percent, since that is the normal proportion of women in total employment in peace-time (1940 census).

Dec. 1942 - Hence, of 17½ million estimated to be needed in war employment, 24 percent could be women, or, say, anywhere from 4 to 4½ million women.

Dec. 1943 - Of 20 million expected to be in war work then [upped from the 18 million in the July 17th release of Manpower Commission], it is reasonable to say that 30 percent would have to be women, or, about 6 million women will by that time be on war work.

U. S. Department of Labor
WOMEN'S BUREAU
Washington

January 21-22, 1942.

COMMITTEE B. - REPORT OF COMMITTEE ON OFFICE WORKERS IN THE WAR PROGRAM

INTRODUCTION

The Situation as to Employment of Office Workers in Defense.

Office workers form an important and necessary link in the defense program, and the great majority of office workers are women. Besides those ordinarily employed in mail order, retail, insurance, banks, and other offices, clerical employees constitute about 14 percent of the workers in all manufacturing plants, 28 percent of those in iron and steel plants, 17 percent of the electrical machinery workers, and so forth.

Demands for office workers are influenced by changes in business conditions in the particular community. Defense production and other expanded business has caused an increase of 10 or 12 percent in the need for office workers in some of the areas surveyed by the Women's Bureau. Elsewhere, the Committee members reported, office workers are being laid off where defense activity is causing restrictions in certain materials and equipment. Other evidence shows workers leaving offices for better pay in defense manufacturing jobs. In some cases this situation has created demand for office workers; in others it is materially changing conditions of work for additional members of office forces, since it has further stimulated the movement toward mechanization of office processes, which has been so pronounced in recent years.

The Needs in Securing Best Defense Service from Office Workers.

A primary requirement in utilizing the services of office workers to the best advantage in the defense efforts is the establishment of effective methods of bringing worker and job together. To assure sufficient mobility of office workers for defense needs, and to maintain their maximum efficiency, experience shows that attention must be given to providing adequate wage standards, job security, suitable working time, proper job classification, and other basic conditions of work and living that are necessary for the highest grade of performance in a field of employment in which mechanization has advanced rapidly, and in which the worker is subject to particular nervous tensions.

In the past, insufficient attention has been given to office workers' needs, though 35 States have fixed maximum hours of work for some office workers, and 8 States have fixed minimum wages for workers in general and professional offices. In addition, office workers in some cases are covered by orders for particular industries. The Committee had at hand a body of material giving information collected by Women's Bureau agents and from other sources, showing the pay received by office workers, and indicating certain standards as to conditions for their work.

Training of Workers for Defense Offices.

Many training facilities already exist for office workers, so that the need is not for new institutions, but for assurance that available courses specifically fit those who take them to meet the major requirements of office jobs today. Skill in stenographic transcription with ability to type rapidly and accurately is much in demand; about 95 percent of the stenographers and typists are women. The great body of employees needed by offices are office-machine operators (other than typists), of whom some 85 percent are women. Over 60 percent of the bookkeepers and cashiers are women. Competent supervisors are needed for this army of office workers; in manufacturing plants about 4 percent of these are women. A new type of job evolving in defense plants for a small group of women will be a combination of clerical with production work.

General Subjects of Recommendations on Office Workers in Defense.

After considering the situations and needs summarized in the foregoing, the Committee made a series of recommendations as to effectively bringing worker and job together; as to adequate conditions of work and living necessary to assure best service; as to training requirements; and as to methods of putting these recommendations into effect.

RECOMMENDATIONS

1. Recognizing the fact that the demand for office workers will be expanded in certain areas, while declining in others, and that as a consequence mobility of numbers of office workers may be important in the defense effort, the Committee recommends:

   a. That the United States Employment Service should be asked to compile and maintain data showing the supply and demand in the various areas; that such data for one area should be placed at the disposal of the Employment Service in other areas and used by them in making effective placements; that the various local branches of this service should make better office arrangements to serve the needs of clerical employees; and that general information about such data should be made available for the use of responsible organizations.

   b. That the technique of taking the work to the worker should be used for office workers as it is for industrial workers, and that as one means of accomplishing this, consideration be given to the feasibility of letting out clerical work on contract to companies throughout the country where there is known to be unemployment or an available supply of office workers.

   c. That office workers who transfer from one area to another be assured adequate protection in job security, wage standards, and other conditions of work, primarily through the development

and extension of trade-union organization, and also by the maintenance and extension of appropriate legislation.

d. That in communities which are expanding due to the war program, office workers be provided with adequate housing and eating facilities, and suitable opportunities for recreation and community life, in order that they may be better able to do their part in the war effort.

2. Recognizing the importance of maintaining fair labor standards in order to preserve the health and efficiency of office workers in the all-out production program, the Committee recommends:

a. That the 8-hour-day standard should be maintained for office workers, and that the Fair Labor Standards Act should be rigidly applied to such workers to assure payment to them of time and one-half for work beyond a 40-hour week.

b. That State minimum-wage provisions should be extended to cover additional numbers of office workers.

c. That office workers should be paid the rate for the job, and that there should be no difference in the rate of pay for a man or a woman for the same job.

d. In view of the particular nervous tension incident to this type of work and the occupational disease prevalent among office workers, that special attention should be paid to proper conditions of work, including adequate lighting, good ventilation, and relief from unnecessary noise and speed-up.

3. Recognizing the need for standardization of clerical job specifications as a means for stabilizing wage rates, the Committee recommends that where no unions are active and consequently adequate wage standards do not exist, organizations interested in white-collar workers should begin to accumulate data for use in setting up job specifications with corresponding fair wage standards; and that where union rates are in effect, job specifications to which such union rates apply should constitute the standard.

4. Recognizing the need for training that is both more thorough and more closely related to the type of work required in offices today, the Committee recommends that better facilities and more adequate instruction be provided for clerical workers; that retraining be provided to aid such workers to transfer to other office jobs; and that to the extent that the present emergency demands, other types of training be provided for office workers to enable them to shift to work in industrial and semiprofessional fields.

5. Recognizing the fact that increasing employment of women office workers in the war program will necessitate additional activity on the part of this Committee and the Women's Bureau, the Committee recommends:

a. That the present Committee on office workers in the defense program function as a continuing committee on this subject, to keep in touch with developments in this field and to recommend from time to time such action as seems important to the condition of office workers in furtherance of all-out production; specifically, it is intended that -

(1) Organizations represented on the Committee will continue their representation, though the personnel representing them may change; and

(2) Representatives of other organizations concerned with this field may be added to the Committee from time to time.

b. That the Women's Bureau keep in touch with trends in the field of office work as related to hours, wages, and conditions of work for office workers; that it inform members of the Committee of such trends; and that it receive reports and suggestions from members of the Committee as to needs of office workers and policies affecting them, and transmit such information and suggestions to other members of the Committee as needed.

c. That the possibility be explored of setting up joint committees with representatives of labor, management, and government, to consider the problems of office workers.

d. That the Women's Bureau refer recommendations of this Committee to the appropriate organizations and authorities, such bodies in turn to transmit the recommendations to the proper units within their groups, both national and local.

e. That this Conference request Miss Anderson to reconvene the entire Conference at intervals of not less than 6 months and more frequently if advisable to provide for adequate action on the pressing problems of women's work in the war effort, and to reconvene the subgroups more frequently to act on their specific problems as need arises.

Jan. 1942

WOMEN'S BUREAU
U. S. Department of Labor
Washington

DEFENSE DEMANDS FOR OFFICE WORKERS

I. NUMBERS OF WOMEN OFFICE WORKERS

Of women workers in manufacturing plants, 14 percent are in plant offices.
Of all women workers somewhat less than a fifth are clerical workers (1930).
This proportion will be increased when 1940 figures are available

A. Office Workers in Manufacturing Plants

B. All Women Office Workers

II. DEMAND FOR OFFICE WORKERS

There is now a widespread demand for competent office workers. Best experience indicates that this may continue, though to a lesser extent, in the post-war period.

A. Demand for New Office Workers Found by Women's Bureau.

B. Demand for Office Workers as Shown by Requests to Employment Services.

C. Demand for Office Workers as Shown by Certain Bureau of Labor Statistics Estimates for Defense Industries.

D. Demand for Office Workers in Federal Employment.

E. Indications as to Post-War Demand.

January 1942

DEFENSE DEMANDS FOR OFFICE WORKERS, AND CONDITIONS OF WORK

I. NUMBERS OF WOMEN OFFICE WORKERS

A. Office Workers in Manufacturing Plants

Industrial operation requires substantial clerical staffs. Plant offices employ about 14 percent of all women workers in manufacturing, according to the Census of Manufactures. (Nearly 377,000) (This does not include managerial or supervisory employees.). The American Management Association reported in 1940 that the ratio of office workers to production workers is constantly growing.

Proportions range from 4 or 5 percent of the workers in textile and apparel plants to 28 percent of those in iron and steel mills and 52 percent of those in printing and publishing establishments. In important industrial centers it is reported that 50 percent of the demands for office workers come from industrial companies.

B. All Women Office Workers

Besides manufacturing plants a wide variety of other services require efficient office workers, such as banks, financial institutions, mail order houses, government agencies, public utilities, educational offices, social work agencies, libraries, and many other community services.

Women clerical workers constitute nearly one-fifth of all employed women (almost 2 million). This number undoubtedly will be greatly increased when 1940 reports of occupational distribution are available. Moreover the 1940 census uses a new classification for white-collar workers "Clerical, sales, and kindred."

II. DEMAND FOR OFFICE WORKERS

A. Demand for New Office Workers Found by Women's Bureau

The demand for new office workers in a particular area is affected by changes in general business conditions and by an increasing population and expansion of production in specific industries. Recent investigations by the Women's Bureau show the following as to demand for new office workers:

Houston, Texas

Regardless of cause, men and women employed in an office for the first time in 1939 formed approximately 12 percent of the total number of office employees in 1940. Such was the degree of adjustment taking place in one year.

Kansas City, Missouri and Kansas

With the defense program and heightened industrial activity in the latter part of 1940 and 1941, employment activity was greater and openings for office workers more numerous. The new demand in late 1939 and early 1940 occurred chiefly in the transportation industry and in the offices of the Federal government. Little expansion took place in other types of offices.

Los Angeles, California

Aircraft had taken on more employees than any other type of office. In other firms the number hired in the year averaged about 12 percent of the present office force; 5 percent being inexperienced and 7 percent being experienced. Insurance, financial offices other than banks, motion pictures, retail stores, manufacturing and distributing, and Federal offices had taken on proportions in excess of 12 percent.

Philadelphia, Pennsylvania

In Philadelphia office workers are in demand in manufacturing, financial institutions and real estate, wholesale and retail trade, public utilities, educational and medical centers, and as Federal, State and city employees. It is reasonable to estimate that defense activity has increased the demand markedly--probably at least 10 or 12 percent.

Richmond, Virginia

The total number of all workers employed in Richmond manufacturing industries increased by 11 percent between 1935 and 1939; in wholesale trade the number of employees increased by 34 percent and in retail trade by 29 percent. Electric customers increased by 14 percent and business telephone connections by 22 percent during the period from 1936 to 1940. In government agencies, both Federal and State, there have been increased demands for new office workers in recent years.

B. Demand for Office Workers as Shown by Requests to Employment Services

During recent months, there have been continual reports of the needs for clerical workers in various areas. Examples follow:

Middle Atlantic Region (Del., D. C., Ky., Md., N. J., Pa., Va., W. Va.)

An increasing volume of workers are being attracted from clerical jobs to defense work, because of higher wages and more desirable working conditions. (Of course this means an increased demand for clerical workers.)

Connecticut

New Haven. - Demand in some places for youths in clerical fields with supply very low.

New York City

In November, the Employment Service was reported unable to fill a large proportion of openings for typists, envelope addressers, bookkeeping machine operators, general clerks, largely because salaries unattractive.

But in December, the mechanization of office operations in large insurance firms has caused many dismissals, and lay-offs of clerical workers also were reported due to material and equipment shortage. However, junior applicants still were in demand.

Illinois

A dearth of clerical workers and stenographers in most of the larger cities is attributed to the failure of wages to keep pace with demand.

Virginia

A bag loading plant in Pulaski County expected to employ 500 clerical workers in the late Fall.

Gulf Region (Ala., La., Miss., Tex.)

Shortage in the clerical field is acute, and employers are offering higher starting wages.

South West Region (Kan., Mo., Okla., Tex.)

In large cities employers are finding it more difficult to obtain experienced ...bookkeepers, stenographers, and operators of office machines. Low wages offered account for small number of applicants.

Rocky Mountain Region (Ariz., Col., Idaho, Mont., N. Mex., Utah, Wyo.)

In towns with defense projects, typists and stenographers are leaving private employers for higher wages in the government service. (This includes Denver, Ogden, Provo, Salt Lake City, and Colorado Springs.)

Wyoming

Employers are hiring unqualified workers, particularly stenographers, to avoid losing them to higher-paying jobs.

C. Demand for Office Workers as Shown by Certain Bureau of Labor Statistics Estimates for Defense Industries

Estimates of needs in the airframe and the engine and propeller industries showed nearly 13,000 office workers needed through November, 1941, as follows:

	Number	Percent of all needed workers
Airframe	9,371	6.7
Engine and propeller	3,618	7.5

Through December, it was estimated that 672 office workers were needed in machine tool plants.

D. Demand for Office Workers in Federal Employment

The demand for clerical workers in the Federal government is so great that examinations are kept continually open for stenographer and typist, alphabetic card punch operator, and tabulating machine operator. In the 1940 fiscal year about 2,800 stenographers and 5,500 typists were employed; but in 1941 the number jumped to 15,000 stenographers and 25,000 typists.

From August 1940 to the middle of May 1941 no stenographer or typist examination was open, except one limited to men. The examination announced in May was to be open until June 9th, but demand was so great that it was extended indefinitely. Twice since that time, requirements were relaxed; since December 15, 1941, a stenographer can be passed with a grade of only 60 in typing, though the minimum for stenography still is 70. Furthermore, if the candidate fails to pass, another examination may be taken after a lapse of 30 days. Requirements still include citizenship, minimum of 18 years, 1 year's residence in the place given as residence, and certain health standards.

In June 1941 a test was announced for four grades of office machine operators. By late September only 1,200 had applied, and few had accepted jobs.

To help solve the difficulty in getting clerical workers, the Civil Service Commission set up a Training Division in September 1941. Formerly, the Department of Commerce had set up training for multilith operators and others, and the Civil Service Commission accepted persons who had completed the Chamberlain Vocational School Course at Roosevelt High School. About the middle of January 1942, the Civil Service Commission's new Training Division set up a school for stenographers. However, agencies have taken trainees from the school more rapidly than classes could be organized. Applicants are taken for training after having passed a civil service test.

E. Indications as to Post-War Demand

Judging from experience after the past war, there is some indication that the demand for office workers, while it may shift as to locality, and while it probably will not skyrocket as now appears to be the case in some places, nevertheless may continue a small but steady increase in the post-war period.

Figures from one State - Ohio - give us some basis for knowing how the demand for office workers ran in an important industrial State after World War I. In the period 1914-18 the number of office workers in that State more than doubled, a much greater increase than in other types of work. After the war, the rate of increase was slowed down, but substantial increases still continued up to the latest time for which figures are available.

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ADVANCE RELEASE ---- ADVANCE RELEASE

File → ~~OFFICE OF WAR INFORMATION~~ WAR MANPOWER COMMISSION

Advance Release: For Wednesday Afternoon Papers, December 8, 1943

Collins-WMC-3336 PM-4480

The civilian working force of the nation now totals about 51,500,000, Paul V. McNutt, chairman of the War Manpower Commission, announced today in releasing a December 1 roundup of manpower progress.

Mr. McNutt cited eight actions as typical of those that have made that total possible and have brought about a more efficient utilization of American manpower. These actions were:

1. Extended development of local employment stabilization plans and vigorous action on the part of major organizations of labor, agriculture, and management to make them effective.

2. Establishment of employment ceilings in labor shortage areas.

3. Establishment of controlled referral programs designed to direct the right workers to the right jobs.

4. Extension of the minimum 48-hour work week, with the resultant savings of manpower.

5. Extension of war manpower utilization programs both by the commission's staff and by industry itself on the basis of commission plans.

6. Readjustment of production schedules from an "incentive" basis to a "feasible expectation" basis permitting a sound readjustment in labor requirements.

7. Special recruitment programs such as that for the nonferrous metal mines, which in the past year have averted a critical shortage and have led to the building up of protective stockpiles of copper, aluminum and other metals,

8. Coordination to cusion the effects of cutbacks.

On the last point Mr. McNutt expressed concern.

"Present cutbacks," he said, "represent shifts in types of production necessary to meet strategic requirements. In terms of total numbers of workers they are not large. They are far smaller indeed than our immediate demands for labor. But they must be made in the right places. Cutbacks in production must take into account war manpower classification of labor market areas.

X-23593

Cutbacks, properly administered, present an opportunity. A year and a half ago the first classifications of areas enabled contracts to be directed from already congested areas to the low points in our war economy. Today the classifications can be used to reduce the peaks and help to balance the strain of our war economy.

"That must be done with care. Should different procurement agency cuts coincide in very tight areas, the result would be a paralyzing shock, a waste of manpower, and a hardship on thousands of workers. We are taking vigorous steps to achieve the necessary coordination."

Mr. McNutt cited a Lowell (Mass.), cutback, where released ordnance workers are being promptly placed in a bearing plant in Connecticut, and a Washington (Pa.) cutback, where the workers were signed up for other jobs before the cutbacks became effective, as examples of sound coordination of manpower policy involved in cutbacks.

Unemployment declined in November to 700,000, Mr. McNutt reported. That figure, he pointed out, is 300,000 below the "bedrock minimum" set by estimates of one year ago. Those now unemployed are almost entirely workers in transition from one job to another and unemployables, he declared.

"Future growth in the working force must come from housewives and others outside the regular labor market. Replacements and expansion in war industry must come through acceleration of transfers from non-war jobs," the War Manpower Commission chairman said.

Local Manpower Stabilization Plans

The vigorous support given by the Management-Labor Committee has had two effects:

(a) The number of employment stabilization plans is increasing. Today there are 150 area and 11 regional plans in effect. Fully operating stabilization plans have been set up in all critical West Coast areas and in other parts of the country.

(b) There is increased recognition of the need for obtaining full compliance with the requirements of these programs. Such vigorous action is represented by the establishment of employment ceilings and strong controlled referral programs, which are receiving local support.

Establishment of Employment Ceilings

Ceilings have been established in many areas as a means of reducing anticipated labor requirements. It was the establishment of a ceiling by the North American Aviation Company that enabled reclassification of that area. Ceilings established for West Coast shipyards have enabled a more accurate channeling of workers and reduced by 97,000 the labor requirements without significant change in volume of shipyard actions.

At the same time Mr. McNutt emphasized that the meaning of these ceilings must be carefully analyzed.

"The manpower problem," he said, "cannot be solved merely by revising the arithmetic. Stated reductions in labor requirements may represent (a) real savings resulting from better utilization and the elimination of hoarding; (b) anticipation of an expected adjustment in production schedules; (c) 'paper profits,' which will be liquidated if the ceiling is artifically low.

"Great care is being exercised to set these ceilings on a sound management basis. Their effects go beyond mere statistical savings. Experience has shown that setting a ceiling stimulates community awareness. This manpower problem heightens both plant, community, and procurement agency interest in manpower utilization. In every area it has led to multiplied requests for manpower utilization surveys."

Establishment of Controlled Referral Programs

As of November 15, 78 employment stabilization plans provided for controlled referral beyond the minimum provisions required in Regulation 7. In 10 areas--Brunswick, Ga.; Dayton, Ohio; Lima, Ohio; Mobile, Ala.; Monroe, Mich.; Panama City, Fla.; Savannah, Ga.; Seattle, Wash.; Sidney, Ohio, and Springfield, Ohio--all workers are subject to controlled referral; in 11 areas, all male workers; and in 61 areas (of which 58 are located in Region VIII--Iowa, Minnesota, Nebraska, North Dakota, and South Dakota--) all workers last employed in an essential activity.

Large numbers of other areas have controlled referral for workers in specified shortage occupations or in critical industries, such as nonferrous metals, coal mining, and lumbering. It is estimated that approximately 4,600,000 workers (about one-tenth of the nonagricultural working force) are subject to controlled referrals beyond that which would be mandatory under Regulation 7.

In order to enable referrals to be made with accuracy, manpower priority committees had by November 15 been established in central Connecticut, Cleveland, Detroit, Akron, Louisville, Buffalo, Los Angeles, San Diego, Portland, Seattle, and San Francisco.

Buffalo, N. Y., has had the longest experience with controlled referrals. Decline of employment in Buffalo steel plants and other heavy industries has been reversed. Employment of women has been increased. Of 56 firms in heavy industry that were not meeting production schedules on June 1, all but 14 had caught up to schedules three months later.

Extension of the Minimum 48-hour Work Week

Efforts to estimate the full effect of the 48-hour week are difficult. A large number of employers shifted their operations to a 48-hour basis through the months prior to the issuance of the order of October 13, last, extending the 48-hour week to all Group I areas and recommending it in the case of Group II areas.

A substantial reduction in labor requirements appears to have resulted in many communities, however. An estimated 10,000 workers were saved in Akron. The Detroit office states that from 12,000 to 20,000 vacancies need not be filled because of the longer work week. Similar reports have been widespread.

Liberal exemptions have been granted in a number of communities. Clerical workers are frequently exempted. Newspapers, utilities, banks, and retail stores are also frequently exempted.

Extension of War Manpower Utilization Programs

The December 1 classification of areas revealed that 15 communities had dropped from Group I to Group II. Various factors were involved, and there was evidence of increased emphasis on manpower utilization programs in such areas and the inauguration of labor-saving policies on the part of industrial management.

At the same time the commission has shown an increasing tendency to challenge reported labor requirements and to insist that adequate utilization surveys be made to support major increases and stated labor requirements.

Special Industrial Problems, Including Nonferrous Mines and Current Priorities

The manpower situation in nonferrous mines was most critical in the spring and summer of 1942. An industry-wide stabilization program was announced in September, 1942, to deal with the problem. The declining trend of employment has since been reversed. A release of 4,500 soldiers with previous mining experience served not only to relieve the shortage, but to dramatize to labor in the mines and other available labor the tremendous war urgency of their jobs. Copper, molybdenum, and zinc are now being produced in quantities sufficient to permit stockpiling. Lead is in plentiful supply.

Further recrutiment efforts are being centered upon mines rated in the Mineral Classification List. Employment in these mines is increasing slightly.

Meanwhile attention is shifting to other industries. Foundries, forge shops, ball bearings, high-octane gas, synthetic rubber, aircraft, ship repair, and lumber currently are top manpower priorities. Local manpower priorities, however, must take into consideration additional factors of place, transportation, and alternative sources of supply.

A recruitment program is under way, focused on 250 foundry and forge shops engaged in critical war production. Workers are directed to those plants which have an effective manpower utilization program.

Certain problems have passed. On the whole this years farm harvest was gathered with very little loss due to labor shortages.

An intensive campaign is under way to recruit off-seasonal farm workers for essential work in non-agricultural fields. Procedures have been simplified to stimulate these transfers. These policies involve:

(a) The recognition of wood cutting as credit toward agricultural deferment up to one-fourth the total production units required.

(b) The granting of permission by local draft boards for off-seasonal work in essential activities, provided eight months of the year are devoted to agriculture.

(c) A waiver of the "certificate of availability" requirement for work not exceeding six weeks in length on the provision that the employer must then obtain the certificate rather than the worker. These policies and simplified procedures are enabling an increased volume of recruitment.

"The lines of approach to allocation and stabilization problems in labor shortage areas are constantly being made clearer," said Mr. McNutt. "Developing experience on the West Coast, evaluation of manpower programs in Buffalo, Dayton and Louisville, and the pattern of developments in communities such as Akron, Detroit and in central Connecticut indicate the following outlines of the approach:

"(1) Allocation of labor by specifying what types of workers may be employed by an establishment and by setting a ceiling on its total employment.

"(2) Referral of available workers to the most urgent jobs.

"(3) Determination of which labor needs should be filled first.

"(4) Careful inspection of labor requirements.

"(5) Closer working relationships among the War Manpower Commission, the War Production Board and the procurement agencies."

ADVANCE RELEASE ---------- ADVANCE RELEASE

~~OFFICE OF WAR INFORMATION~~
WAR MANPOWER COMMISSION

Advance Release: For Tuesday Morning Papers, December 7, 1943

Collins-WMC-3336 PM-4477

A total labor force of 66,300,000 in July, 1944, is envisaged in a reappraisal of manpower requirement estimates announced today by Chairman Paul V. McNutt of the War Manpower Commission. This number, an increase of 1,500,000 over July, 1943, will be by far the largest ever mobilized into productive employment or military service in this country.

Reappraisal of estimates was desirable, Mr. McNutt said, in view of these two developments:

(1) Employment of non-war activities such as trades and services is not declining as predicted.

(2) Changed estimates by the War Production Board indicate that munitions expenditures during the calendar year 1944 are not expected, owing to changes in the program dictated by military experience and strategy, to exceed $76,700,000,000, whereas the War Manpower Commission's estimate for munitions industries, announced last June 28, was based upon an earlier War Production Board production schedule totalling $82,400,000,000 for 1944.

It is now expected, according to Mr. McNutt, that munitions employment will increase only to 10,700,000, instead of 11,600,000, as estimated in June. Employment in trades and services will decline only slightly from 10,600,000 to 10,500,000, instead of to 9,900,000. Employment in the Federal War Agencies will remain constant at 1,600,000, instead of increasing to 2,000,000. A few other less significant revisions have also been made in estimates.

Mr. McNutt said he considered expansion of the total labor force to 66,300,000 feasible. The increase in the labor force due to population growth should provide approximately 500,000 above and beyond normal losses from death, disability and retirement, he pointed out. The remaining 1,000,000 must be new workers, primarily women.

"The total of 10,700,000 workers which will be needed in the munitions industries represent an increase of 1,400,000 over the July, 1943 level and one million over September, 1943," Mr. McNutt said.

(Over)

"Since the additional requirements are heavily concentrated in Group I and Group II areas, any statistical adequacy of labor reserves in the Nation as a whole provides no basis for complacency.

"The net strength of the Armed Services is expected to rise to 11,300,000--two million over July 1943, and 1,700,000 over September 1943. Actual withdrawals will be considerably higher, since losses resulting from casualties and discharges must be compensated; however, some of the discharged men and women will return to the civilian labor force.

"Employment in non-war manufacturing and in trades and services will not fall off to any significant extent. Therefore, we cannot anticipate a large volume of transfers out of less-essential activities in the absence of effective measures to bring this about.

"The release of more than 600,000 construction workers between September 1943 and July 1944 will provide a valuable pool of skilled labor."

(Editors: Attached is summary of manpower requirements and labor supply, July, 1943 - July, 1944.)

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ADVANCE RELEASE ---- ADVANCE RELEASE

OFFICE OF WAR INFORMATION
WAR MANPOWER COMMISSION

Advance Release: For Friday Afternoon Papers, December 3, 1943

Broughton -- WMC 3381 PM-4476

A saving of 97,000 workers required for West Coast shipyards as a result of the operations of the West Coast Manpower Program was announced today by Chairman Paul V. McNutt of the War Manpower Commission. Mr. McNutt's report was based on statements filed by West Coast manpower officials.

At the same time, aircraft employment, the decline of which in June, July, and August had threatened production and led to inauguration of the West Coast plan, turned upward. "Two of the most critical plants, Boeing and Lockheed," the report stated, "have already asked to have their referrals reduced because they were not able to absorb new workers as fast as they were referred."

Mr. McNutt gave credit for the speed with which these results had been achieved to the action of State and Area War Manpower officials and to the work of Management-Labor Committees which have been revising stabilization plans, installing controlled referral systems, and setting policies and standards for Manpower Priority Committees. He cited six points of progress shown by the report.

"Drastic reductions have been made in anticipated labor requirements due primarily to the establishment of employment ceilings and improved utilization of the existing labor force;

Throughout the entire region employment stabilization programs have been revised in line with the new program;

A program of controlled referrals has been put into effect in each of the critical areas;

The number of workers in the aircraft industry has further increased, rising by nearly 3,900 from October 1 to November 1. Due in part to the setting of employment ceilings, employment in the shipbuilding industry declined;

Additional numbers of workers have received occupational deferments from Selective Service;

The program as a whole is gaining recognition and support throughout the region."

(over)

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The saving of 97,000 workers in the shipyards resulted from the Commission's review of employment needs of 28 major West Coast shipyards which had stated needs for 130,000 workers. This figure was scaled down to 33,000. Yet no major revision in the volume of shipyard activity has been made as the result of the West Coast Manpower Program.

Some shifts have been made from one type of activity to another. Some naval yards have transferred their attention from construction to ship repair. Water has been squeezed out of some anticipated labor requirements. For some ship yards, employment ceilings have been set below the current level.

"The most drastic cutback in shipbuilding labor requirements," the report stated, "occurred in the San Francisco area where well over 40 per cent of the total Pacific Coast labor force is located. Although the 9 major yards in that area previously reported a combined need for over 68,000 workers, the established ceilings allow for an expansion of only 6500."

To date, Mr. McNutt said, there have been no substantial cancellation of contracts or curtailment of civilian activities under the program.

Here follows an abridgment of the report:

Actions Taken on the West Coast Manpower Program, October 15 - November 15, 1943

Abridgment of the Report

1. Establishment of Employment Ceilings---Manpower Priorities Committees

The Manpower Priorities Committees have established employment ceilings for a large number of plants in each area. Ceilings for major firms were re-examined and revised on the basis of production urgency lists. Ceilings were also set for unrated establishments, limiting them to the level of employment as of a recent date. Specifically, in addition to ceilings previously established in Washington and Oregon, ceilings have been established in Los Angeles, San Diego, and San Francisco. In these areas, ceilings for a majority of firms have been established as the maximum number of full-time employees on the payroll during the month of October.

2. Controlled Referrals

Controlled referral under a system of manpower priorities has been placed in each of the critical areas during the month. Programs in the Portland and Seattle areas went into effect Nov. 1, and in Los Angeles, San Diego, and San Francisco approximately Nov. 15. In some areas controls extend to all workers and in others to all men and to women in selected occupations. In order to facilitate hiring, key employers in Los Angeles, and San Diego are permitted to hire at the gate. Elsewhere hiring channels are limited to the Employment Service, authorized government agencies, and labor unions. In Southern California, 146 unions have been authorized as referral agencies for their members. In Oregon, Civil Service, Railroad Retirement Board, and recruiting and manning organizations of the War Shipping Board have been approved as referral agencies for government establishments, the railroad industry, and the maritime industry. Referrals by labor unions and government agencies must conform to War Manpower Commission standards.

As a result of the priorities and ceilings labor demands have been reduced or at least held down, while referrals to high priority establishments have increased. Two of the most critical aircraft plants (Boeing and Lockheed) have already asked to have the volume of referrals reduced because they were not able to absorb new workers as fast as they were referred.

3. Management-Labor Committees

The Management-Labor Committees have been active in revising stabilization programs and are in general agreement with controlled referral plans; they have taken an active part in setting policies and standards for the Priorities Committees. Labor unions and management have given wide support to the Management-Labor Committees at the various levels. The National Management-Labor Committee has assisted in presenting developing policies to constituent organizations.

Increased confidence in the West Coast Program on the part of the Management-Labor Committees is partly due to the fact that to date there has been no substantial cancellation of contracts or curtailment of civilian activities.

4. Utilization and Training

Utilization surveys are being made in each of the areas as rapidly as time and staff permit. At present the staff of the Bureau of Manpower Utilization is being enlarged in order to meet the increasing need for surveys. The training procedures of the War Manpower Commission are being revamped to augment the supply of trained workers in the West Coast States. The Director of Training has recently issued a bulletin outlining devices to be used in upgrading workers, improving the quality of training offered and the methods of making the training needs known.

5. Selective Service Activity

In order to implement the plan for deferment of aircraft workers in the States of California, Washington, and Oregon, the National Headquarters of the Selective Service issued Local Board Memorandum No. 115-E on November 6. This memorandum advises local baords that the Army and Navy will assume joint responsibility with aircraft manufacturers and aircraft subcontractors and suppliers in requesting occupational deferment of employees, in case it is agreed by representatives of the Army and Navy and employers that the deferments are required to maintain aircraft production schedules. Instructions have been issued to the procurement officers of the Army Air Forces and the Naval Forces to cooperate in this work.

6. Information Program

In each area rapid development of an effective program has been made possible by the cooperation of newspapers and radio. Copies or digests of the program have been widely distributed to employers and unions. The War Advertising Council and the Pacific Advertising Association officials have cooperated in planning the educational program. The advertising firm of Foote, Cone, and Belding is the agency primarily responsible for advertising copy as well as placement of advertising on a sponsored, cooperative basis at no cost to the War Manpower Commission. The Los Angeles Advertising Club has agreed to do the organizing work in this connection.

(over)

7. Major West Coast Aircraft Plants

Total employment for 12 major airframe plants increased during October from 288,634 to 292,507, a net gain of nearly 3,900 according to manufacturers' reports to the War Manpower Commission.

Labor requirements of major West Coast airframe plants have been sharply reduced by the inauguration of the West Coast Manpower Program. Employment ceilings recently established by manpower committees for the 7 major firms provide for a relatively small employment expansion (15,000) above November 1 employment levels. Previous estimates (October reports) of manufacturers indicated that 332,706 workers would be needed at peak production, whereas current ceilings total only 308,065 workers. Employment ceilings are subject to revision following a recent conference of officials of the War Production Board and the War Department with West Coast aircraft manufacturers on their minimum additional labor needs to reach peak production.

Turnover

Considerable improvement in labor turnover during October, as compared with September, was reported by 12 major West Coast Aircraft plants. Total accessions increased slightly during October, the average rate per 100 employees rising from 6.9 in September to 7.1 in October. Total separations dropped substantially during the same period, the average rate per 100 employees being 7.6 in September and 6.4 in October.

Turnover Rates for Major West Coast Aircraft Firms (August 1--October 31, 1943) (Per 100 employees):

	Accessions	Separations
August	5.8	7.5
September	6.9	7.6
October	7.1	6.4

Employment Trend for Major West Coast Aircraft Firms (September 1 to November 1, 1943) (From War Manpower Commission Reports):

	September 1	October 1	November 1	Employment Ceilings
Total of Firms[1/]	291,451	288,634	292,507[2/]	308,065[2/]

1/ Comprising 12 establishments

2/ Preliminary data.

8. West Coast Shipbuilding Schedules

Over one-fifth of all new naval tonnage and more than one-third of all Maritime tonnage are produced by West Coast yards. This area is also a major repair center. As a result of over-all revisions in the nation's shipbuilding program, a shift from defensive naval vessels to landing craft, and the emphasis upon critically urgent production imposed on shipbuilding by the West Coast Manpower Program, there are several significant recent production developments on the Pacific Coast: (1) Contracts placed with West Coast yards for the building of 13 destroyers, cruisers, and fleet tugs have been cancelled and awarded to several East Coast yards; (2) several firms have begun to shift from low priority to highly urgent new construction and to ship repair work; and (3) low priority construction programs, such as patrol escort craft, are being abandoned in order to free Pacific Coast yards for the repairing of battle-damaged ships. No major revisions have been made in maritime yards, despite the fact that employment ceilings have been set below the current employment level in some yards.

Employment Trends and Ceilings

As a result of employment ceilings established for West Coast employers by the Area Manpower Priorities Committees, an anticipated expansion of the labor force engaged in 28 major selected West Coast shipyards, representing over three-fourths of the total labor force in the Pacific Coast shipbuilding industry, has been materially curtailed.

By Nov. 1, 1943, there were approximately 453,000 workers in the major selected West Coast yards, a reduction of 6,100 from the number employed on Oct. 1, 1943. Except for shipyards in the Los Angeles area, a downward trend in shipbuilding employment during the months, July 1 - Nov. 1, 1943, occurred in all Pacific Coast Communities.

Major West Coast Shipbuilding employers previously reported to the War Manpower Commission that they anticipated an increase of approximately 130,000 workers in order to reach peak employment, and to meet future production schedules. As a result of employment ceilings placed upon these 28 major shipyards, future labor requirements to peak have been sharply reduced to slightly more than 33,000 workers, a 75 per cent downward revision of previous estimates, and representing only slightly more than a 7 per cent increase over the number employed on Nov. 1, 1943.

Of the 28 major yards, 15 reported that the institution of the employment ceilings will result in either a decrease in employment or in an expansion of less than 500 workers each. The most drastic cut-back in labor requirements occurred in the San Francisco area where well over 40 per cent of the total Pacific Coast labor force is located. Although the 9 major yards in the area previously reported a combined need for over 68,000 workers in order to reach peak employment, the established ceilings allow for an expansion of only 6,500.

Employment Trend for 28 Major West Coast Shipbuilding Yards (Sept. 1 - Nov. 1, 1943) (From War Manpower Commission Reports)

	Sept. 1	Oct. 1	Nov. 1	Employment Ceiling
Total of Firms	464,715	459,153	453,067	486,982

Turnover Rates for West Coast Shipbuilding Firms, (Aug. 1 - Oct. 31, 1943) (Rate per 100 employees)

	Accessions	Separations
August	12.3	13.2
September	11.4	12.4
October	10.9	11.7

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Washington

mothers - children etc. in here

MEMORANDUM

Manpower Requirements and Available Labor Supply
April 1942 - December 1943
by
Seymour L. Wolfbein
Bureau of Labor Statistics 1/

Manpower Requirements

A labor force of 62.5 million persons (including the armed forces) will be required by December 1943 according to estimates prepared by the Bureau of Labor Statistics and the Bureau of Employment Security. This represents an increase of 5.6 millions over the April 1942 labor force which totaled 56.9 million persons.

The increase of 5.6 million workers between April 1942 and December 1943 will come from two sources. Approximately 1.2 million men and women will become workers between April 1942 and December 1943 as part of the normal labor force growth during that interval. The remainder - 4.4 millions - must be supplied from such persons as students and homemakers who normally would not participate in the labor market.

The quantitative framework of manpower requirements may therefore be summarized as follows:

	(In millions)
Labor force required in December 1943	62.5
Actual labor force in April 1942	56.9
Increase required between April 1942 and December 1943	5.6
Normal labor force increase April 1942 to December 1943	1.2
Additional labor force increase required	4.4

The estimated manpower requirements for April 1942 and December 1943 are shown in Table 1, while Table 2 presents a detailed age and sex breakdown of the normal labor force increment between these two dates.

Available Labor Supply

The increase of 4.4 millions over and above the normal labor force increment between April 1942 and December 1943 will be supplied from all categories among the nonworkers. These include students, women engaged in home housework, persons voluntarily idle, and even those who had retired or considered themselves too old to work, but who are already finding gainful employment in the war economy.

1/ Prepared in the Occupational Outlook Division, Charles D. Stewart, Acting Chief.

The group which will supply the bulk of the additional workers needed between April 1942 and December 1943 are the women engaged in home housework, who constituted approximately two-thirds of the total number of nonworkers in April 1942. The following analysis is designed to show the pattern of labor market participation among women which could exist if all of the 4.4 million persons needed by the end of 1943 were drawn from one specific group among the nonworkers, i.e., women engaged in home housework who do not have any children under 16 years of age. 2/

For purposes of this analysis the potential labor supply among women consists of two groups: women already in the labor force in April 1942 and women engaged in home housework who do not have any children under 16 years of age. Together, they accounted for 30.16 million women or 59 percent of the total female noninstitutional population in April 1942. The three important groups among female nonworkers who are excluded are the homemakers with children under 16, students, and women too old or unable to work. A detailed age breakdown of the various groups in the female noninstitutional population is given in Table 3.

The estimated additions to the labor force that might be made from homemakers without children under 16 years of age are shown in Table 4, on the assumption that employers hire women of various ages in the proportions in which they are now employed. All of the estimated 4.4 million persons needed between April 1942 and December 1943 were taken from this group. Their age distribution was estimated by assuming that the age distribution of women already in the labor force will prevail among the new entrants, not because this would be the most desirable method of recruitment, but because it represents the most conservative method of estimating the adequacy of our labor reserves. The resulting pattern of labor market participation among women is shown in the second chart. It is significant to note that this will still leave a reserve of well over 11 million homemakers without children under 16 years of age, most of whom, however, would be concentrated in the age groups 40-64 years. If women are recruited as indicated, the potential reserve, consisting largely of older women, would not be a satisfactory one for a further large expansion of the labor force in 1944. In addition to these older women there would still be an untapped reserve of homemakers with children under 16 (more than four-fifths of whom were concentrated in the age groups 20-44 years) and students.

The summary data presented up to this point indicate that overall labor supply will not limit the necessary expansion in the size of the labor force. The major manpower problem will be to recruit potential workers, to give them the necessary training, and to place them where they are needed.

Changes in Employment Status of the Noninstitutional Population: April 1942-December 1943

Some indication of the gross changes among the various components of

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2/ The following analysis, therefore, is not a forecast of expected labor market participation among nonworkers.

the total noninstitutional population required between April 1942 and December 1943 is shown in Table 5 and the third chart. These changes, of course, are greater than the net of 5.6 millions indicated in the summary statement. In manufacturing alone, an increase of 6.4 million workers is required between April 1942 and December 1943 if manufacturing establishments are to increase their employment by 4.6 millions and send 1.8 million men to the armed forces at the same time.

As can be seen from Table 5, a total of 8.7 million additional workers will be needed to meet the requirements of expanding production and an increased armed force between April 1942 and December 1943. Only four of the industrial components can make workers available for other employment and still contribute their share of men to the armed forces. These are agriculture, trade, contract construction, and the self-employed which will yield a tot of only 1.6 million workers available for conversion to other employment. Most of the increase in manpower requirements between April 1942 and December 1943 will be supplied from the normal labor force increment (1.2 millions), the unemployed (1.8 millions), and the nonworkers (4.1 millions). 3/

It should be noted that the amendment to the Selective Service Act making persons 18 and 19 years of age liable for service in the armed forces will change the estimates presented in Table 5. Since deferment for physical reasons or for dependency would be small among this group, the great majority of these persons will enter into active service. This will change the industrial distribution of the armed forces as shown in Table 5. Industries which characteristically employ younger workers, e.g., agriculture, will be called upon for a proportionately greater contribution of manpower to the armed forces than would industries which employ comparatively older men, e.g. as in mining.

3/ An additional .3 million nonworkers are expected to be drawn into the armed forces.

Table 1. Estimated Manpower Requirements April 1942 and December 1943 1/

	-- in millions --	
	April 1942	December 1943
TOTAL LABOR FORCE	56.9	62.5
Armed forces 2/	3.2	9.0
Labor force, excluding armed forces	53.7	53.5
Unemployed	3.0 3/	1.0
Employed	50.7	52.5
Agriculture	9.3 3/	7.9
Nonagriculture	41.4	44.6
Self-employed, proprietors, domestic servants	5.4	5.0
Employees:	36.0	39.6
Manufacturing	14.0	18.6
Mining	.9	1.0
Contract construction	1.8	1.0
Transportation and public utilities	3.4	3.7
Wholesale and retail trade	6.7	5.5
Finance, service, and miscellaneous	4.3	4.0
Government	4.9	5.8

1/ Military production requirements based upon munitions and construction expenditures approximating $70 billion (annual rate) in December 1942 and $80 billion to $85 billion in December 1943.

2/ Unofficial, based on data released prior to December 7, 1941, and statements published since.

3/ Monthly Report on the Labor Force, Current Surveys Section, Bureau of the Census.

Prepared by:
Bureau of Labor Statistics
Occupational Outlook Division
November 16, 1942

Table 2. The Normal Labor Force in April 1942 and December 1943, Classified by Age and Sex

(in thousands)

Age	Estimated Labor Force 1945 1/	Labor Force 1940 2/	Normal Increment April 1940-April 1942	Normal Labor Force April 1942	Normal Increment April 1940-Dec. 1943	Normal Labor Force Dec. 1943
Female						
14 years	17	19	- 1	18	-1.5	17
15-19	1,285	1,366	-32	1,334	-60.8	1,305
20-24	2,893	2,678	+86	2,764	+161.3	2,839
25-29	2,083	1,993	+36	2,029	+67.5	2,061
30-34	1,712	1,580	+53	1,633	+99.0	1,679
35-39	1,625	1,346	+112	1,458	+209.3	1,555
40-44	1,317	1,117	+80	1,197	+150.0	1,267
45-49	1,091	933	+63	996	+118.5	1,052
50-54	929	721	+83	804	+156.0	877
55-59	637	505	+53	558	+99.0	604
60-64	436	330	+42	372	+79.5	410
65-69	164	172	- 3	169	-6.0	166
70-74	57	60	- 1	59	-2.3	58
75 +	26	27	- 0	27	-0.8	19
				13,418		13,909
			Change: 4/42-12/43	491		
Male						
14 years	63	70	-3	67	-5.3	65
15-19	2,418	2,501	-33	2,468	-62.3	2,439
20-24	5,471	4,997	+190	5,187	+355.5	5,353
25-29	5,533	5,174	+144	5,318	+269.3	5,443
30-34	5,223	4,855	+147	5,002	+276.0	5,131
35-39	4,754	4,540	+86	4,626	+160.5	4,701
40-44	4,185	4,182	+ 1	4,183	+2.3	4,184
45-49	3,798	3,905	-43	3,862	-80.3	3,825
50-54	3,677	3,408	+108	3,516	+201.8	3,610
55-59	2,968	2,637	+132	2,769	+248.3	2,885
60-64	2,178	1,895	+113	2,008	+212.3	2,107
65-69	1,146	1,125	+8	1,133	+15.8	1,141
70-74	494	484	+4	488	+ 7.5	492
75+	225	221	+2	223	+ 3.0	224
				40,850		41,600
			Change: 4/42-12/43	750		

1/ Prepared in Occupational Outlook Division, Bureau of Labor Statistics, See "Estimated Growth in the Labor Force, 1940 to 1945" Monthly Labor Review, November 1941.

2/ Bureau of the Census, U. S. Department of Commerce.

Prepared by:
Bureau of Labor Statistics
Occupational Outlook Division
November 16, 1942

Table 3. Composition of the Female Noninstitutional Population in April 1942, Classified by Age 1/

(in millions)

Age	Noninstitutional Female Population 2/	Students	Too Old or Unable to Work	Homemakers with Children Under 16	Balance: Women in the Labor Market and Homemakers Without Children Under 16
14-19years	7.4	4.5	.10	.52	2.28
20-24	6.0	.1	.10	1.72	4.08
25-29	5.7		.05	2.55	3.10
30-34	5.3		.05	2.79	2.46
35-39	4.9		.04	2.43	2.43
40-44	4.4		.06	1.79	2.55
45-49	4.0		.04	1.20	2.76
50-54	3.6		.06	.62	2.92
55-59	2.9		.10	.19	2.61
60-64	2.4		.30	.03	2.07
65-69	1.9		.38	.00	1.52
70-74	1.4		.57	.00	.83
75 +	1.3		.75	.00	.55
	51.2	4.6	2.60	13.84	30.16

1/ Estimates based on data from the Monthly Report on the Labor Force, interpolated for 5 year age groups by use of 1940 Census data and classified by presence of children under 16 from Barkev Sanders "Potential Expansion in Labor Force," Bureau of Research and Statistics, Social Security Board. Appendix Table C 2 (unpublished).

2/ Projected from April 1940 Census data.

Prepared by:
Bureau of Labor Statistics
Occupational Outlook Division
November 16, 1942

Table 4. Women in the Labor Force April 1942 and Estimated Additions to the Labor Force from Homemakers Without Children Under 16 Years, Classified by Age 1/

(in millions)

Age	Women in the Labor Market and Homemakers Without Children Under 16	Single Women in the Labor Force	Married Women in the Labor Force	Homemakers Without Children Under 16	Estimated Additions to the Labor Force by December 1943 2/	Balance of Homemakers Without Children Under 16
14-19 years	2.28	1.66	.04	.58	.54	.04
20-24	4.08	2.38	.32	1.38	.84	.54
25-29	3.10	1.48	.52	1.10	.63	.47
30-34	2.46	1.09	.51	.86	.51	.35
35-39	2.43	1.01	.49	.93	.48	.45
40-44	2.55	.90	.40	1.25	.41	.84
45-49	2.76	.72	.28	1.76	.32	1.44
50-54	2.92	.62	.18	2.12	.26	1.86
55-59	2.61	.48	.12	2.01	.19	1.82
60-64	2.07	.34	.06	1.67	.13	1.54
65-69	1.52	.18	.02	1.32	.06	1.26
70-74	.83	.06	.01	.76	.02	.74
75 +	.55	.03	-	.52	.01	.51
	30.16	10.95	2.95	16.26	4.40	11.86

1/ Estimates based on data from the Monthly Report on the Labor Force, interpolated for 5 year age groups by 1940 Census figures and adjusted for marital status from data in Appendix C 1 of Barkev Sanders, op. cit.

2/ Estimated by applying age distribution of women in the labor force to 4.4 million needed between April 1942 and December 1943.

Prepared by:
Bureau of Labor Statistics
Occupational Outlook Division
November 16, 1942

Table 5. Estimated Shifts in Employment Status of the Noninstitutional Population April 1942 to December 1943

(in millions)

	April 1942	December 1943	Change 4/42-12/43	Withdrawals to Armed Forces 4/42 - 12/43	Replacements for Armed Forces 1/	Additional Needed	Available for Other Employment
Agriculture	9.3	7.9	-1.4	1.0	-	-	.4
Manufacturing	14.0	18.6	+4.6	1.8	6.4	-	
Trade	6.7	5.5	-1.2	.7	-	-	.5
Government	4.9	5.8	+.9	.5	1.4	-	
Finance, service, miscellaneous	4.3	4.0	-.3	.3	-	-	
Transportation and public utilities	3.4	3.7	+.3	.4	.7	-	
Contract construction	1.8	1.0	-.8	.2	-	-	.6
Mining	.9	1.0	+.1	.1	.2	-	
Self-employed	5.4	5.0	-.4	.3	-	-	.1
Unemployed	3.0	1.0	-2.0	.2	-	-	1.8
Nonworkers	45.3	40.9	-4.4	.3	-	-	4.1
Armed forces	3.2	9.0	+5.8	-	-	-	-
	102.2	103.4	-	5.8		8.7	7.5 2/

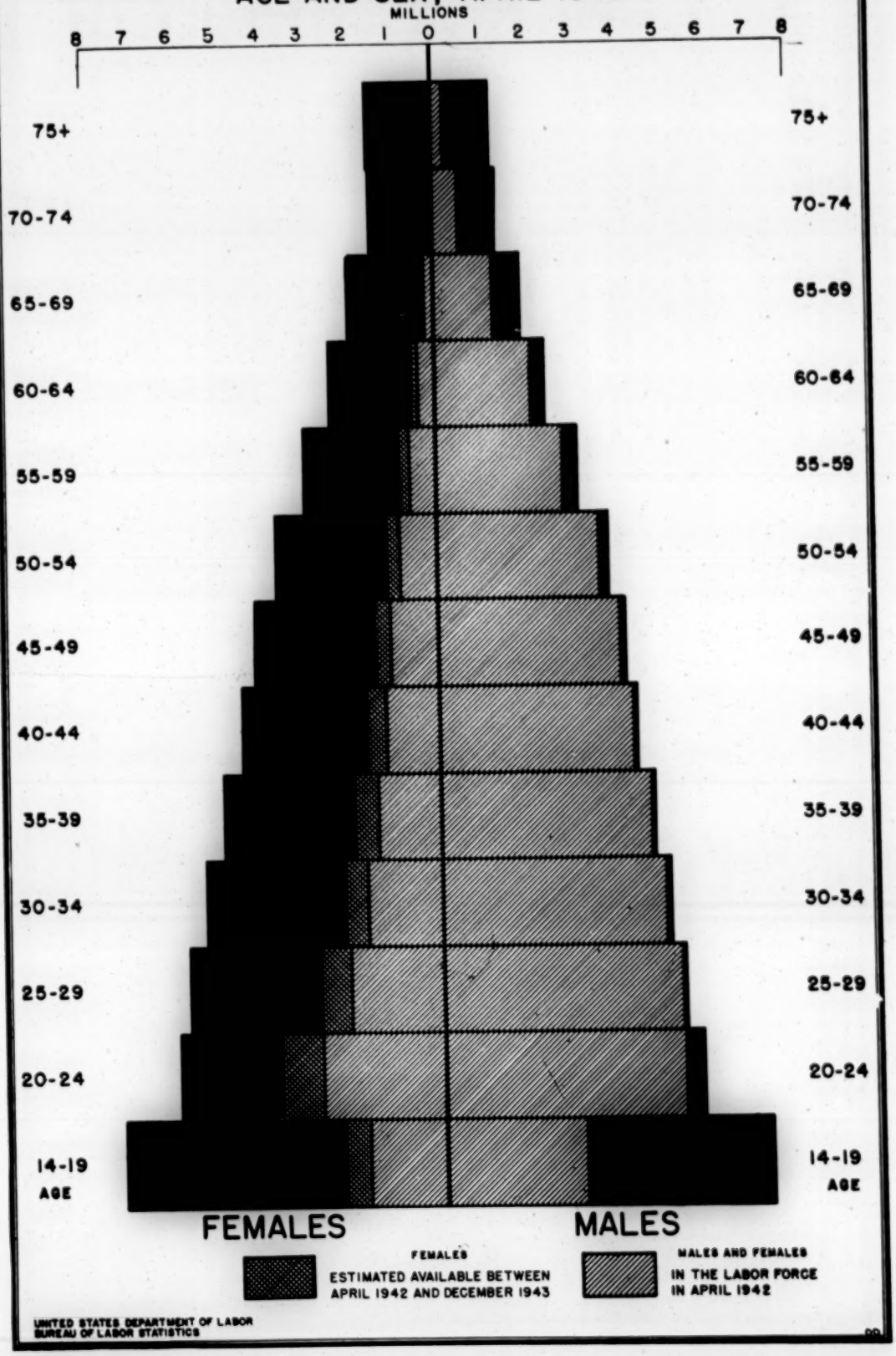
1/ Estimated by applying to the various components age and sex ratios by industry from unpublished 1940 Census material, adjusted for changes from 1940 to 1942 by data from the Census Monthly Report on the Labor Force and the Bureau of Labor Statistics Semi-Annual Survey of Employment by Sex.

2/ In addition to the normal labor force increment of 1.2 million.

Prepared by:
Bureau of Labor Statistics
Occupational Outlook Division
November 16, 1942

POPULATION 14 YEARS OF AGE AND OVER

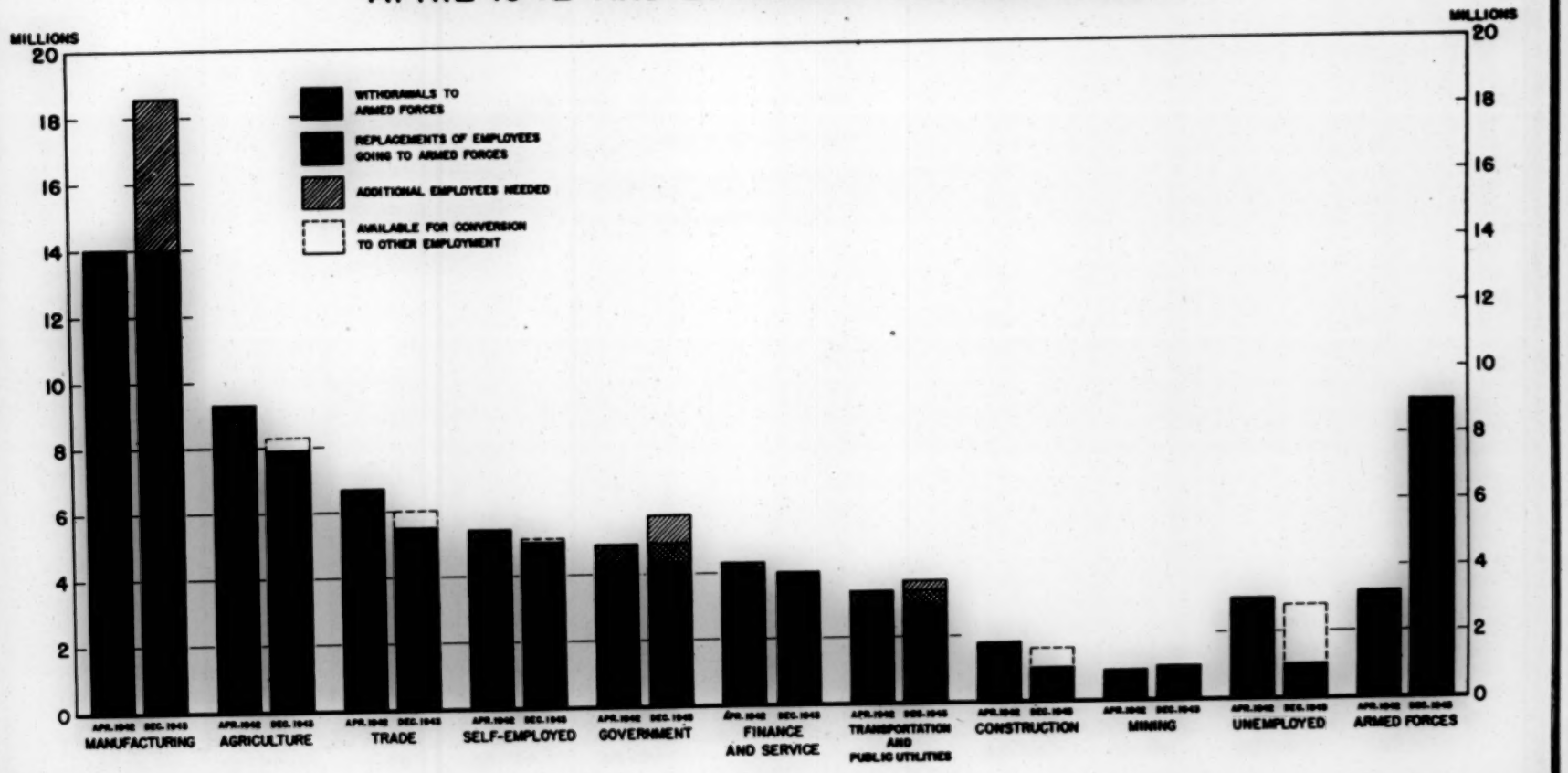
CLASSIFIED BY LABOR MARKET PARTICIPATION AND BY AGE AND SEX, APRIL 1942



UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

EMPLOYMENT STATUS OF PERSONS IN THE LABOR FORCE

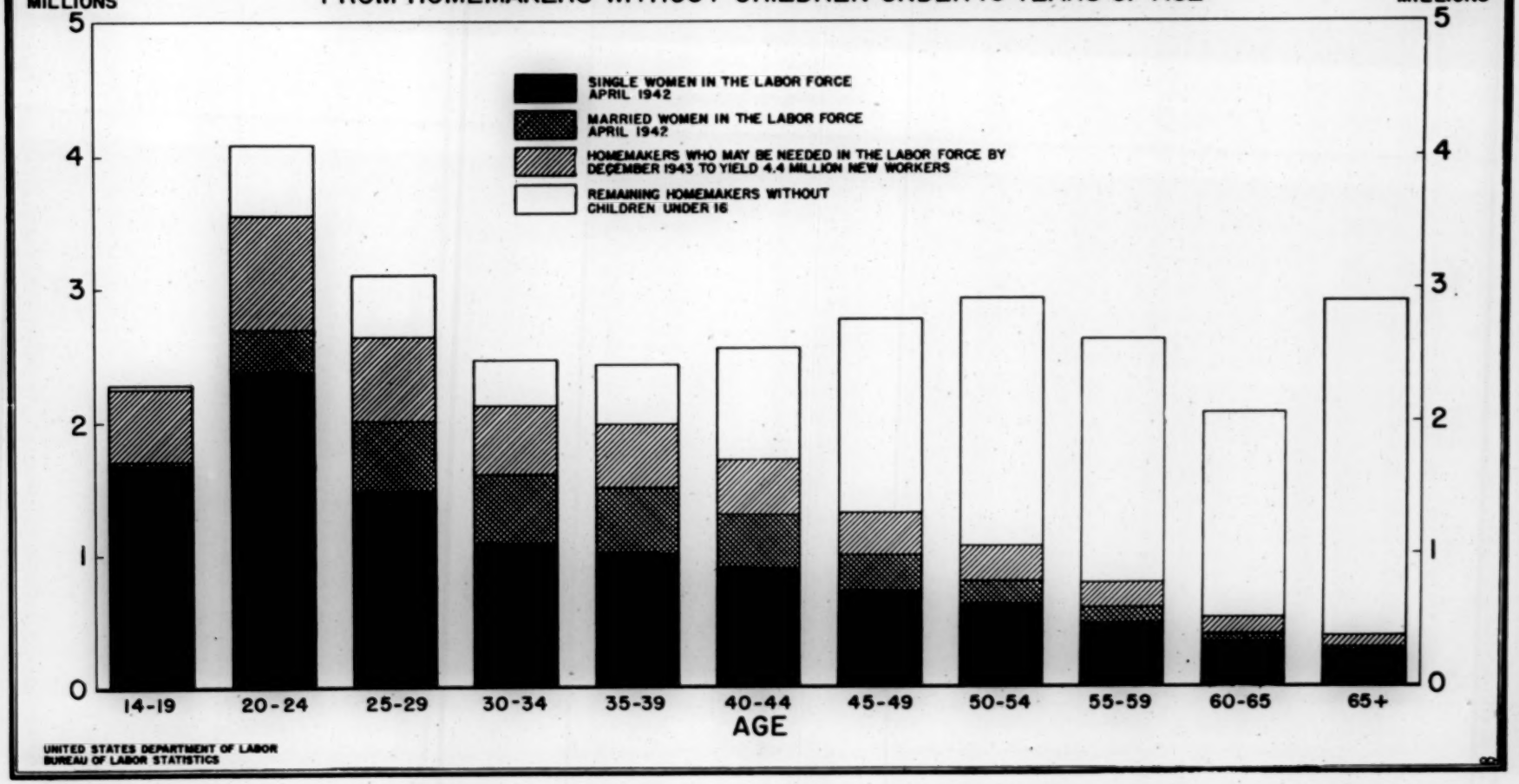
APRIL 1942 AND ESTIMATED DECEMBER 1943



UNITED STATES DEPARTMENT OF LABOR
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WOMEN IN THE LABOR FORCE AND ESTIMATED ADDITIONS TO THE LABOR FORCE

FROM HOMEMAKERS WITHOUT CHILDREN UNDER 16 YEARS OF AGE



UNITED STATES DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

Labor INFORMATION BULLETIN

OCTOBER 1943

Plan Safety Aid for 12,500,000 Workers

In-plant training courses for 625,000 foremen to improve safety conditions for over 12,500,000 war production workers are now being conducted under the sponsorship of the U. S. Department of Labor and the Federal Office of Education. They are directed by many of the 40,000 war plant supervisors who have completed safety training courses conducted in 116 engineering colleges.

"When the defense program got under way three years ago we in the United States Department of Labor knew the Nation lacked trained safety engineers," Secretary Perkins said. "So we set up college courses in industrial safety for the initial training of supervisory production men. Much of the instruction was given by more than 600 special agents of the U. S. Department of Labor, all of whom are trained safety engineers who donate 20 percent of their time to the Government for such work.

"The new program of foremen safety training represents a fundamental shift in emphasis and a step on the way to ultimate on-the-job safety knowledge for 12,500,000 workers in war industries."

Training will cover specific safety problems of the plant and industry. Special agents of the National Committee will assist supervisors in class instruction. Outlines, guides, text material, references, and supplementary bulletins have been prepared by the Labor Department's Division of Labor Standards.

Consultation service is also offered to smaller war plants by the special agents of the Department of Labor. Safety records of over 10,000 plants serviced by them last year show a marked reduction in accident frequency in 66 percent of the cases. More than a million man-days were saved to war production as a result of their efforts.

UNITED STATES DEPARTMENT OF LABOR

FRANCES PERKINS, Secretary

Committee Finds Living Cost Index Trustworthy

The cost of living index, compiled monthly by the Bureau of Labor Statistics of the U. S. Department of Labor, was found "trustworthy" and "a satisfactory instrument for measuring * * * average movements in the retail prices of goods and services purchased by city workers" by a special committee of the American Statistical Association which investigated the index and has made public its report. The Committee, headed by Frederick C. Mills of Columbia University, was appointed last May, by E. A. Goldenweiser, President of the American Statistical Association, when Secretary Frances Perkins, at the request of the Bureau of Labor Statistics, suggested that a study of the index be undertaken by the Association.

The Committee reported that it "canvassed interested labor organizations, employees' associations, and consumer groups. Evidence on changes in living costs has been submitted to us by representatives of these groups and by governmental agencies. Special studies of food prices in cities throughout the country have been initiated by the Committee and conducted by agents of the Bureau of Labor Statistics under the supervision of committee representatives.

The Committee has examined specific criticisms that have been made of the Bureau's index and finds that:

1. Special studies made for the Committee "confirm the essential accuracy of the food prices reported to the Bureau."
2. "Food price reports from the retail stores included in the regular Bureau sample are representative of prices prevailing in stores patronized by wage earners * * * ."
3. "The Bureau does obtain above-ceiling prices charged in ordinary retail outlets * * * and these prices are included in the index * * *. It is not likely, however, that all such cases are reported to the Bureau * * *. For food products this error does not exceed 2 percent. Transactions in rationed foods effected without exchange of ration coupons are not and should not be represented in an official index of living costs."
4. "Consumers' goods and services, in the aggregate, have since 1939 suffered some loss of quality that is not reflected in reported prices. No dollar value can be put on this loss. In large part it is an intangible and immeasurable element in the cost of the war."
5. "The rents reported directly by tenants are free from bias and may be accepted as accurate."
6. "The sample of dwellings covered are satisfactory representations of family dwellings in the cities represented in the general index. * * * These 34 cities do not adequately represent the diversity of urban housing conditions in the country as a whole. We recommend * * * an increase in the coverage of the index."
7. "For the areas covered * * * the index of rents provides an acceptable measure of changes in the cost of housing for urban workers who live in the same communities and in residences of the same general type as those occupied before the war * * *."

The Committee points out that "many of the difficulties and doubts concerning the index have their origins in attempts to use it uncritically for purposes to which it is not adapted." "The index is designed to measure only those changes in family expenditures resulting from changes in unit prices. It is not designed to measure alterations in family expenditures resulting from changes in manner of living, whether the changes are due to choice or necessity. Such alterations can be measured only by other statistical devises, such as direct inquiry into family incomes and expenditures * * *. The distinction between changes in family expenditures due to price movements and those due to shifts in the way of living is of especial concern today * * *."

The Committee recommends an expansion in the coverage of the Bureau's indexes, subject to considerations of cost and the need of Congressional committees and administrators for more information on the cost of living. Separate indexes are recommended for different regions in the country, communities of different size, and certain specialized industrial areas. "The general index is a national average, and relates to large cities only. There is considerable variation in the level of living costs in different parts of the country, and in the degree of change in living costs in different regions. There are industrial variations in living costs. Costs in coal towns and textile towns are affected by special factors and have distinctive movements."

The Committee noted that there is at the present time no cost of living index for rural, nonfarm families and recommended that the interested Government agencies prepare indexes representing changes in cost of living of this group. They also recommended the development of measures of geographic differences in cost of living, and frequent small-sample studies of family expenditures.

In commenting on the report, Miss Perkins said, "We are gratified that the special committee headed by Dr. Mills, after its exhaustive investigation into the manner in which the index is compiled, has found it to be a trustworthy measure of changes in the prices paid by consumers for goods and services."

"As the report points out, much of the criticism which has been leveled at the index arises from a misunderstanding of its function. The index is a measure of changes in retail prices and rents paid by city families of moderate income. I am grateful to the members of the Committee for the painstaking manner in which they examined the method used in assembling prices and compiling the index. They were Dr. Frederick C. Mills of Columbia University, Chairman; Dr. E. Wight Bakke, Yale University; Dr. Reavis Cox, University of Pennsylvania; Dr. Margaret Reid, Iowa State College; Dr. Theodore W. Schultz, University of Chicago; and Dr. Samuel Stratton, President of Middlebury College. I am happy that they have found that the index is doing the job it was set up to do."

Task of Industrial Nurse Grows in Importance

Professional nurses were first employed by commercial establishments nearly 50 years ago. Their duties were to visit the sick in their homes. There are now about 15,000 industrial nurses in the United States and the number is growing. Very few years ago there were only about 3,000 full-time graduate registered nurses in industry. In addition, at that time, some visiting-nurse associations made contracts for part-time service, usually to small establishments which could not afford and did not need a full-time nurse. This is still done, and experiments are being made in cooperation among several small plants sharing medical services.

Medical departments in industrial plants began with the idea of controlling compensable accidents. Now the concept is rapidly changing to an emphasis on the health factors which condition the productivity of the worker. Anything that detracts from the worker's productive ability—poor health, fatigue, uncomfortable surroundings, and so on—must be eliminated if possible. Among industrial workers, however, the illnesses and injuries incurred on the job account for less than a tenth of total time lost from work as a result of disability.

A survey being carried on by the Pennsylvania Bureau of Industrial Hygiene gives some indication of the numbers of plants and workers with nursing and other medical services available. By the early summer of 1943, report had been made on more than 3,000 plants in 24 counties, employing nearly 238,000 women and 570,000 men. More than half the plants made either textiles and their products or metals and metal products, but all main industry groups were represented. Plants employing fewer than 25 workers were not included; many were very large companies.

Only about 8 percent of these plants furnished full-time nursing service; 2 percent had part-time service. Together these employed a little more than half the workers. In small plants nursing service was the exception. In establishments employing from 25 to 500, such service was available for little more than a tenth of the workers.

In surveys made in 1942 of nearly 1,000 plants chosen because they had some organized medical service it was found that all but 70 had full-time registered nurses, in the great majority of cases women. On the average, nurses served nearly 800 workers each. There was a tendency for nurses in the ordnance and chemical industries to have charge of fewer workers. Large plants in other fields averaged over 1,000 workers per full-time registered nurse. It is recommended by the Public Health Service that for maintenance of complete health service there should be one nurse for up to 300 employees, two or more nurses for up to 600 employees, three or more for up to 1,000.

Generally speaking, the industrial nurse must have excellent surgical skill. Now, in addition, there is a growing recognition of the fact that she should combine with this some of the skills of the Public Health nurse and learn how to make the best use of the facilities of the community.

Every industrial nurse should become familiar with the industrial processes in the plant, the occupational hazards and the various methods used for their control. In the small plant where little or no direct medical supervision exists, and where no engineering control program is in effect, a thorough sanitary survey can be undertaken by the nurse. Simple forms will enable her to make an intelligent sanitary survey, even though she may lack technical knowledge of medical and engineering phases of industrial hygiene. Frequently such a survey results in the elimination of sources of unpleasantness and ill health too often overlooked.

Besides nursing and first-aid work, the Public Health Service lists among the duties of the in-

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dustrial nurse participation in the medical-examination and the health-education programs, assistance with accident-control and safety-education programs, and assistance with plant sanitation.[1]

There are no full-time professional training courses especially qualifying graduate nurses for work as industrial nurses. A number of universities in various parts of the country have offered, especially since the outbreak of war, "refresher courses" for industrial nurses, usually meeting on an extension basis one night a week for a total of 16 to 32 hours. Columbia, Johns Hopkins, Western Reserve, Loyola, Chicago, Marquette, and a number of other universities with nursing schools have sponsored subject courses. In some cases management has been interested enough in increasing the efficiency of the employed nurse to pay tuition for these courses. The University of Washington and the University of California in Los Angeles have sponsored instruction courses for industrial nurses lasting not more than 3 weeks.

There is a professional organization of industrial nurses, formed about a year ago, called the American Association of Industrial Nurses, and wherever such a group is large enough in the town or the community, they are developing local organizations for study of their special problems. All industrial nurses belong to their State professional associations, and there is a tendency for them to become a distinct section of the State Nursing Association. Otherwise they are grouped with public-health nurses.

[1] *Manual of Industrial Hygiene and Medical Service in War Industries. Division of Industrial Hygiene, U. S. National Institute of Health, U. S. Public Health Service 1943. pp. 67, 68.*

War Plants Find Part-Time Jobs For Women

Part-time employment has been very unusual in factories in the past but is now being resorted to in many areas to meet the shortage of workers. Women with heavy home responsibilities are able in many cases to undertake part-time jobs though a full schedule would be out of the question.

Representatives of the Women's Bureau, U. S. Department of Labor, found that employers in localities where a woman-labor shortage exists were already employing women on "Victory" or short-time shifts. These shifts followed three general patterns: Short-hour or part-day shifts; shifts of approximately full daily length but covering only a half week or occurring on alternate days; week-end shifts. Of these, the short-hour shifts were by far the most common.

Short-hour or part-day shifts usually were 4 hours in length and were worked on 5 or 6 days a week, making a total weekly employment of 20 or 24 hours. A few shifts were 6 hours in length. No part-time employment on 7 consecutive days was reported.

In practically all plants visited, part-time workers had been employed only a few months, and hour schedules still were on a tentative or experimental basis. Some plants had only one part-time shift, with all part-time workers employed the same hours. Others had a number of different part-time shifts, arranged to suit the convenience of various groups of workers. A few plants teamed up part-time workers in pairs, so that one worker would be employed for the first half of a regular 8-hour shift, and her alternate would then come in and work the second half of the shift. In such cases the beginning hour of the first worker and the ending hour of the second worker coincided with the corresponding hours of the regular full-time shift.

Plants in general had no prevailing policy concerning the relation of their short-hour schedules to full-time schedules; some short-hour schedules overlapped, and others coincided with full-time schedules. One unusual arrangement was that in which the short-hour shift was used to keep the plant in operation by filling in the 4-hour stretch between two regular 10-hour shifts.

Shifts that occur during the morning or afternoon, conflicting less with family meals, usually are most convenient for women with heavy home responsibilities or with children of school age. One firm employing 400 part-time workers was adapting the work to "whatever hours the workers would come" and had adopted a wide variety of morning and afternoon shifts.

Late afternoon shifts usually were designed to attract high-school students. If the shift extends through the dinner hour it is not convenient for the homemaker. In a plant with two late-afternoon shifts, high-school girls were three-fourths of the workers on a 4-to-8 shift, while there was a large proportion of homemakers on a 3-to-7 shift.

Several plants had small groups of homemakers on evening shifts, an arrangement some women find convenient. Students and women with full-time jobs elsewhere also were employed, but the latter is opposed to the Women's Bureau standard of total worktime not in excess of 48 hours, especially since it takes time to get from one job to the other. No part-time women were found on the graveyard shift, though one plant was reported to be recruiting women to split such a shift. The Women's Bureau recommends that women should not be employed part time at night, as they must in addition perform their normal household duties in daytime in spite of broken rest.

As most shifts were only 4 hours in length, the question of a meal period usually did not arise. However, some plants had longer shifts that still were less than 8 hours. In one plant women were working 6 hours with only a 5-minute rest; this is too long a stretch. Moreover, part-time shifts that begin and end at odd hours give little opportunity for a full meal either just before or just after the shift. The Women's Bureau recommends that women on shifts of more than 5 hours should be allowed a regular lunch period of at least 30 minutes. Where the shift is 4 hours or longer there should be a rest period of at least 10 minutes midway through the shift.

Part-time shifts employing women all day on 2 or 3 consecutive days or on alternate days were found in some plants. Employers stated that most of these workers were homemakers with families, chiefly older women. In one plant women were working daily from 9 to 4, one and one-half hours less than the regular shift. This enabled them to get their children off to school before coming to work. Some plants working on a continuous 24-hour 7-day basis were using full-day part-time workers to take the places of regular women workers on their days off.

A few firms have organized shifts on which workers are employed either for week ends only or, in some cases, all day Sunday and 2 or 3 evenings during the week. Part-time workers are sometimes employed on week-end shifts to take the places of full-time workers on their regular day off. Part-time week-end shifts are composed chiefly of white-collar workers and others with full-time jobs elsewhere who are willing to do extra work in "spare-time" hours. Some homemakers also find week-end shifts convenient, as they can leave the children with their husbands on the latter's one day off.

Employment on their weekly day off of women employed a full week elsewhere defeats the purpose of part-time shifts; it impairs the worker's efficiency so that over a period of time she will produce less on both jobs. The Women's Bureau recommends that women should not be employed as part-time workers where such employment will necessitate their working 7 days and deprive them of their weekly day of rest.

Production jobs on which women part-time workers were most frequently employed were assembly, light machine work, inspecting, packing. Women part-time workers also performed such assorted machine and hand operations as the following: Filing, drilling, burring, hand milling, spline milling, electric soldering, and grinding.

The consensus of employers appeared to be that independence of work, though desirable, is not essential on part-time jobs. Several employers stated, however, that part-time workers would be employed most successfully on operations that are separate and complete in themselves rather than part of a continuous process.

In the plants visited by the Women's Bureau, practices in connection with wage rates usually were the same for part-time workers as for full-time workers. The beginning rates were the same for both and progression to higher rates occurred at similar intervals. Job rates were the same for both groups. Where a higher rate was paid for working on a less convenient shift, such as the evening or the night shift, the differential was in effect for part-time workers as well as for full-time. Though rates for both groups were the same throughout, part-time workers could not earn so much proportionately as full-time workers because their short hours eliminated premium pay.

A number of war plants from which information was obtained by Women's Bureau representatives in April 1943 employed women on a part-time basis for clerical work, both in the office and as timekeepers in the plant. Usually this work was of a simple or routine nature, such as the job of mail clerk or file clerk. It was considered impracticable to employ part-time workers on elaborate office machines, as it was necessary to get maximum service from such machines by using them continuously throughout the day. One firm, which employed chiefly high-school girls on the part-time shift, reported that they could not afford to let the machines lie idle during the morning. By putting on a morning part-time shift and employing workers in "teams," one girl on the first shift and the other on the second, it would be possible to use part-time workers on such machines throughout the day.

Part-time employment in trade and service industries is not new, but the war has given it a new usefulness. The fact that exceptionally large numbers of homemakers are now employed outside their homes makes the facilities offered by trade and service industries doubly important. At the same time, women seeking part-time work prefer it in war plants. The employment office in an eastern city had 600 unplaced applicants for part-time work who were reluctant to enter service industries.

One of the chief drawbacks to trade and service jobs is the relatively low pay. For example, a survey of laundries by the New York Department of Labor showed average hourly earnings of women and male minors in 1942 to be only 43 cents. Less than a fifth of them had earned as much as 50 cents. In contrast, the Women's Bureau found that in 132 war plants in New Jersey reporting on entrance rates, 87 in every 100 women paid by the hour usually earned 55 cents or more. Only 7½ percent were receiving less than 50 cents, only 1½ percent less than 45 cents, while more than half were paid at least 65 cents.

The part-time study of the Women's Bureau, titled *Part-Time Employment of Women in Wartime*, is issued as No. 13 of its series of special bulletins.

Munitions Plants Show Absenteeism Cut

Absence rates in June continued at about the same levels as in previous months according to a survey among 25 manufacturing industries conducted by the Bureau of Labor Statistics. Of these industries 13 reported reductions in absence rates between May and June, 9 reported increases, and 3 recorded no change. The petroleum refining, iron and steel, and explosives industries continued to report the lowest rates, in each case less than 3.5 percent. At the other extreme, the shipbuilding and airframes industries experienced absence rates of 8.1 and 7.2 percent respectively.

While improved over the May level, the June absence rate in bituminous coal mines remained higher than 8 percent. Absenteeism in anthracite and metal mines continued at about the same levels in most manufacturing industries.

Between March and May, continued significant reductions in absences were reported in the manufacture of firearms and metal-working machinery, and in each of these cases there was further improvement in June. In the anthracite and bituminous coal mining industries, a sharp increase in absenteeism between March and April, reflecting unsettled conditions, was counterbalanced by marked improvements between April and May, which continued into June. In none of the industries covered was there a substantial increase in absence rates during the period covered by the identical-plant group comparisons.

In most of the industries covered the proportion of women employed increased significantly between March and May.

Employment and Weekly Pay Rolls

The total number of employees in nonagricultural establishments was 38,295,000 in August 1943. This level of employment, although 88,000 less than in July, was nevertheless almost 500,000 above August 1942. With the exception of manufacturing, all the industry divisions contributed to the decline over the month. The increase in manufacturing reflects the expansion in war production employment. (These figures exclude proprietors of unincorporated businesses, self-employed persons, domestics employed in private homes, public emergency employees, and personnel in the armed forces.)

MANUFACTURING

The increase of 29,000 wage earners in the durable goods group of manufacturing industries and the decline of 9,000 in the nondurable group resulted in a net increase of 20,000 wage earners in all manufacturing industries between July and August. Among the durable goods groups, the only sizeable changes in employment occurred in the transportation equipment and automobile groups. Considerable expansion in the aircraft industry, which was only partially offset by declines in shipbuilding employment, resulted in an increase of 9,000 wage earners in the transportation equipment group. The increase of 24,000 wage earners in the automobile group also reflects the further expansion of the aircraft industry as well as increased employment in the production of other war material. (The automobile industry converted to the production of war goods in 1941 and 1942 and is now on a complete wartime footing.)

Among the nondurable groups, only the food group showed a sizeable increase in employment. A seasonal increase in the canning industry and a contraseasonal increase in slaughtering and meat packing raised employment in the food group to 1,033,000 wage earners, 17,000 above July. The leather, chemical, and textile groups, with employment declines of 5,000, 8,000, and 13,000, respectively, were responsible for the decline in nondurable employment.

Weekly earnings in all manufacturing industries averaged $42.76 in July as compared with $43.35 in June. The decrease in weekly earnings was due to a decline of .8 of an hour in the workweek, occasioned by the Independence Day holiday.

NONMANUFACTURING

Employment in bituminous coal mining and metal mining were each 13 percent below the level in August 1942. The bituminous coal mining industry employed only 378,000 wage earners in August 1943 as compared with 435,000 in August 1942. Although each of the components of the metal mining group employed fewer wage earners in August 1943 than a year ago, the decline of 10,600 wage earners in gold and silver mining was primarily responsible for reducing employment in this group by 13,800.

Estimated number of wage earners and average weekly earnings in manufacturing industries by major industry groups

[Adjusted to Bureau of Employment Security final data for 1941 and preliminary data for the second quarter of 1942]

Industry group	Estimated number of wage earners (thousands)			Average weekly earnings		
	August 1943	July 1943	August 1942	July 1943	June 1943	July 1942
ALL MANUFACTURING	(*Preliminary*) 13,915	13,895	12,869	$42.76	$43.35	$36.43
Durable goods	*8,315*	*8,286*	*7,192*	*48.81*	*49.33*	*42.51*
Iron and steel and their products	1,709	1,711	1,620	47.27	48.08	40.16
Electrical machinery	707	709	564	44.72	45.59	41.72
Machinery, except electrical	1,247	1,246	1,114	51.14	52.27	47.04
Transportation equipment, except automobiles	2,319	2,310	1,673	55.90	55.84	51.86
Automobiles	718	694	534	57.18	57.10	50.98
Nonferrous metals and their products	414	414	387	47.03	47.51	40.94
Lumber and timber basic products	481	484	561	31.51	32.78	26.98
Furniture and finished lumber products	360	360	369	32.36	33.05	26.95
Stone, clay, and glass products	360	358	370	35.40	36.29	30.54
Nondurable goods	*5,600*	*5,609*	*5,677*	*34.01*	*34.41*	*28.94*
Textile mill products and other fiber manufactures	1,206	1,219	1,283	27.16	27.66	24.02
Apparel and other finished textile products	834	833	915	26.05	26.67	21.76
Leather and leather products	325	330	367	29.13	29.81	25.91
Food and kindred products	1,033	1,016	1,125	35.52	36.01	30.17
Tobacco manufactures	87	89	97	27.37	26.45	22.43
Paper and allied products	316	316	298	35.59	36.47	30.19
Printing, publishing, and allied industries	337	339	325	40.02	40.38	36.06
Chemicals and allied products	734	742	623	42.04	42.00	37.32
Products of petroleum and coal	126	126	129	51.73	51.21	40.73
Rubber products	193	192	158	45.00	47.10	39.05
Miscellaneous industries	409	407	357	40.17	40.97	33.53

Estimated number of wage earners and average weekly earnings in selected nonmanufacturing industries

Industry	Estimated number of wage earners (thousands)			Average weekly earnings		
	August 1943	July 1943	August 1942	July 1943	June 1943	July 1942
Anthracite mining	(*Preliminary*) 70.2	71.4	76.8	$39.69	$29.52	$32.09
Bituminous coal mining	378	379	435	42.76	31.92	32.18
Metalliferous mining	93.3	95.4	107.1	43.30	44.39	38.05
Iron	32.6	33.7	33.1	40.82	42.14	37.01
Copper	29.3	29.9	30.8	46.53	47.78	39.89
Lead and zinc	18.2	18.3	19.1	42.47	43.26	38.53
Gold and silver	6.4	6.7	17.0	39.69	41.48	34.43
Miscellaneous	6.8	6.8	7.1	45.52	45.66	37.19
Hotels (including salaried employees)	347	347	327	20.18	20.00	17.58
Power laundries	258	268	277	23.47	23.64	20.66
Dyeing and cleaning	80.3	84.5	82.9	27.55	28.61	24.04

The Cost of Living in August 1943

Fresh vegetable prices continued seasonally lower from mid-July to mid-August and resulted in the third consecutive monthly decline in the cost of living for city workers—a drop of one-half of one percent. Food prices as a group were down 1.3 percent and more than balanced smaller increases during the month for other goods and services.

Since the decline in food prices began in May, the average family food bill for staples has come down by 4.1 percent and the entire cost of living by 1.5 percent. The index now stands at 123.2 percent of its 1935–39 average.

Food prices are high, notwithstanding these summer declines. They averaged about 9 percent above last year and nearly 47 percent above the low levels prevailing just before the outbreak of war in Europe in August 1939. This August the sharp price declines for fresh fruits and vegetables averaged 7 percent, but they were considerably greater in some cities than in others. Cabbage, sweetpotatoes, apples, and green beans decreased in price from 15 to 25 percent over the month, and other vegetables showed smaller reductions. Despite these declines, vegetable prices remained at comparatively high levels, about 33 percent above last August and more than 90 percent above August 1939.

Aside from fresh produce, the most important declines in August were for fresh fish, which had been rising steadily to more than double pre-war levels. Under a new OPA ceiling regulation, there was a decline during the month of 3.5 percent. The cost of meats also decreased over the month, representing continued adjustments to an OPA "cutback" which reduced prices in the previous month. Egg prices showed a seasonal advance of 9 percent, and the cost of tea rose 4.6 percent.

Differences from city to city in food price changes were unusually great from July to August. In northern areas price reductions were especially large, amounting on the average to 2.3 percent in New York, 2.9 percent in Detroit, and 2.8 percent in Bridgeport and Denver. In many southern cities, because of the earlier growing season, prices had already begun to increase seasonally.

Living costs other than food increased moderately from July to August. Clothing prices rose 0.2 percent over the month. The disappearance of lower price lines of men's business shirts, undershirts and work shoes, women's percale wash frocks and girdles, and scattered increases in the cost of other clothing articles accounted for the increase from July 15 to August 15. Clearance sales were largely responsible for the decline in the cost of men's summer-weight suits and straw hats.

Housefurnishings costs advanced 0.1 percent on the average from July to August, due to increases of 0.3 percent in the cost of Axminster rugs, inexpensive living-room and medium-priced bedroom suites, and cook stoves. Fuel, electricity, and ice costs also increased 0.1 percent, as a result of small advances in the cost of lignite, coal, coke, and ice.

Miscellaneous goods and services rose 0.3 percent over the month. Medical and dental services, hospital charges, motion-picture admissions, beauty and barber shop services, laundry soap and cigarettes all increased slightly from July 15 to August 15.

Rental charges are collected at the quarterly periods March 15, June 15, September 15, and December 15 and have shown little change for some time.

Cost of living in 21 large cities

Area and City	Index as of August 15, 1943 (1935–39=100)	Percent of change from— July 15, 1943, to Aug. 15, 1943	Aug. 15, 1942, to Aug. 15, 1943	Aug. 15 1939, to Aug. 15, 1943
Average: Large cities	[1] **123.2**	[1] **−0.5**	**+4.9**	**+24.9**
North Atlantic:				
Boston	119.9	−.2	+4.0	+23.5
Buffalo	125.3	−.6	+4.0	+27.2
New York	122.6	[2] −.8	+5.5	+23.8
Philadelphia	122.5	−.1	+5.0	+25.3
Pittsburgh	123.6	[3] −.2	+5.9	+25.6
South Atlantic:				
Baltimore	125.4	−.4	+5.3	+27.1
Savannah	131.9	−.2	+8.5	+32.8
Washington, D. C.	122.7	−.2	+5.0	+24.4
North Central:				
Chicago	122.7	[4] −.2	+4.5	+24.3
Cincinnati	123.8	[5] −.1	+5.5	+27.2
Cleveland	127.8	+.1	+7.5	+27.8
Detroit	124.6	−1.1	+5.6	+26.5
Kansas City	120.7	0	+5.0	+22.4
Minneapolis	120.8	−.2	+3.8	+21.2
St. Louis	122.6	−.4	+4.4	+25.0
South Central:				
Birmingham	126.4	+.2	+6.4	+28.3
Houston	122.1	−.3	+3.8	+21.3
Western:				
Denver	121.0	−1.3	+4.0	+22.7
Los Angeles	124.5	−.4	+2.7	+23.9
San Francisco	124.3	[6] −.8	+3.9	+25.2
Seattle	125.8	−.3	+3.4	+25.4

[1] Rents surveyed at quarterly intervals, March 15, June 15, Sept. 15, Dec. 15.
[2] Index for July revised—All items 123.6 food 140.5.
[3] Index for July revised—All items 123.8 food 138.9.
[4] Index for July revised—All items 123.0 food 137.1.
[5] Index for July revised—All items 123.9 food 137.9.
[6] Index for July revised—All items 125.3 food 140.0.

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Labor Files

9/15/43

August 30, 1943

Hooks

(Tables detached (In notebook))

WOMEN IN THE WARTIME LABOR MARKET

Summary

The number of women in the civilian labor force in July 1943 was at an all-time peak of 17.7 million, almost 4 million more than in July 1940. Within the last several months the female labor force has increased beyond the normal seasonal amount by the entrance of approximately a million workers, but many of them are students who will probably return to school when the summer is over. If these are discounted, it is evident that the net number of women entering the year-round labor force in recent months has been relatively small, and that without substantial increases, we will be unable to meet requirements set for January 1944.

Expected declines in construction, and trade and service have not occurred, nor has there been sufficient transfer of workers from less essential to essential activities. As a result, male workers have not become available for other types of employment, making necessary an increase in the number of women workers beyond what was formerly anticipated.

The addition of a million women to the labor market between July 1943 and July 1944 is needed to meet the estimated overall requirements. The heaviest demand for women workers is in the munitions industries, most of which must be met by January 1944. These are net increases which make no allowance for the replacement of the sizable number of women leaving the labor market. Furthermore, demand is largely concentrated in shortage areas where women who were readily available for employment are already at work. On a national basis there were in April 1943 5.6 million nonfarm housewives between the ages of 20 and 55 without children under 16. These women are theoretically the most available for employment, and intensive recruitment efforts must be directed primarily to this group in order to bring the required number of women into the labor market.

The Female Labor Force

Entrance of women into the labor market has up to now gone far to achieve the high levels of war production and to maintain our civilian economy in the fact of large-scale withdrawals of men into the armed services. Women made up about one-fourth of the total civilian labor force in July 1940; 3 years later the proportion had risen to 32 percent with one out of every three women 14 years of age and over in the labor market (Table 1).

The dramatic increase in employment of over 6 million women during the 3-year period July 1940-July 1943 was effected in part by the reemployment of jobless women seeking work (Table 1 and Chart 1). Female unemployment dropped from 3 million in July 1940 to a practically irreducible minimum of about one-half million in July 1943. The remaining increase was due to a net addition to the labor force of close to 4 million women, of whom probably 3 million would not have been attracted to the labor market under normal peacetime conditions.

Table 1.--Civilian labor force and employment, by sex and year, July 1940 - July 1943

Year	Civilian labor force				Employment			
	Total	Male	Female		Total	Male	Female	
			Number	Percent of total			Number	Percent of total
	(In millions)				(In millions)			
July 1940..	56.9	43.1	13.8	24.3	47.6	36.8	10.8	22.7
July 1941..	56.6	42.6	14.0	24.7	50.9	38.9	12.0	23.6
July 1942..	56.8	41.6	15.2	26.8	54.0	39.9	14.1	26.1
July 1943..	55.5	37.8	17.7	31.9	54.3	37.2	17.1	31.5

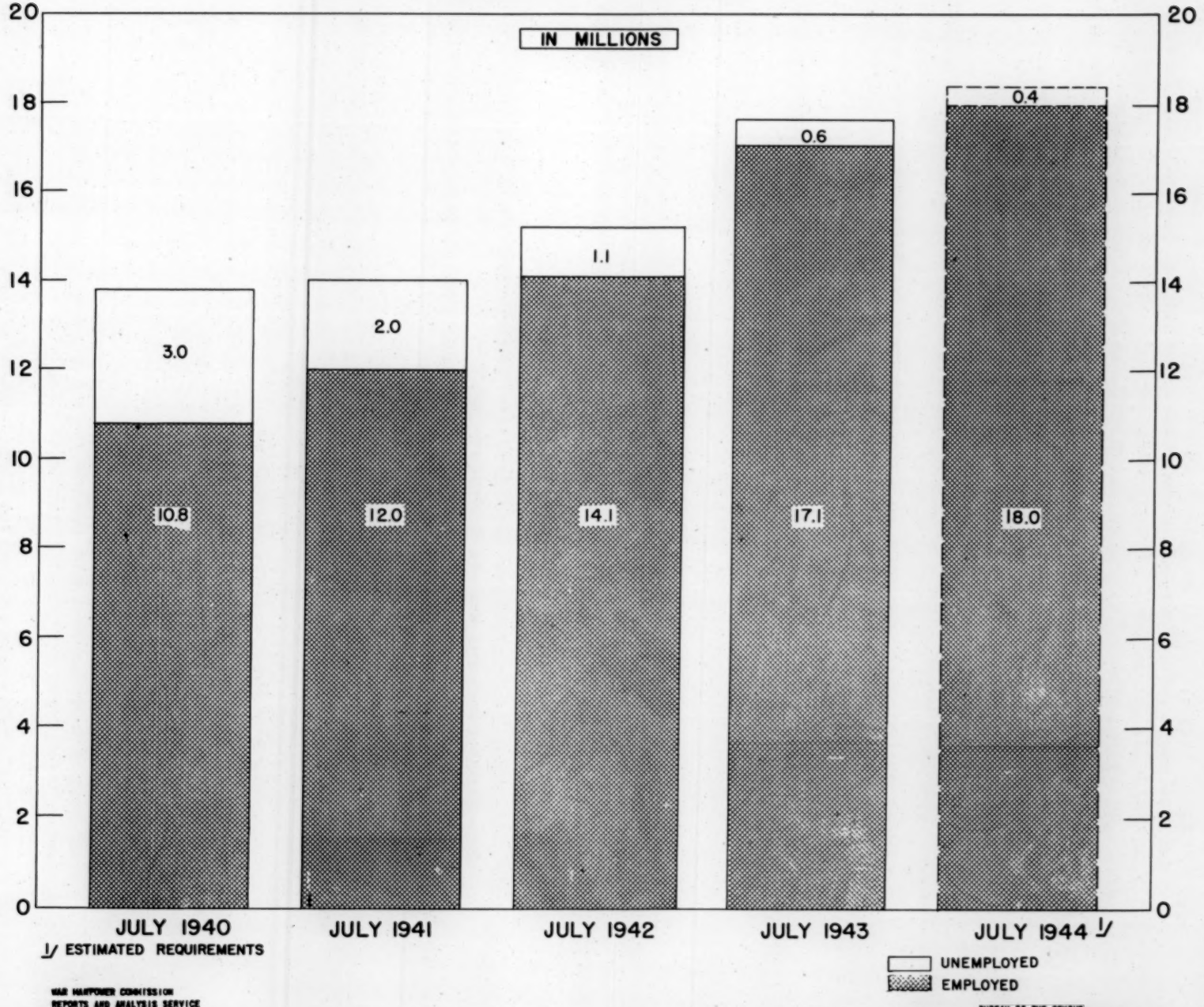
Source: Monthly Report on the Labor Force, Bureau of the Census

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CHART NO. 1

FEMALE LABOR FORCE

JULY 1940 - JULY 1944



1/ ESTIMATED REQUIREMENTS

WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE
STATISTICS DIVISION

SOURCES: BUREAU OF THE CENSUS
REPORTS AND ANALYSIS SERVICE-W.M.C.
BUREAU OF LABOR STATISTICS

7-2805 P3 mdw

About three-fifths of the total increase in the female labor force since 1940 occurred in the last year, when the number of women working or seeking work rose from 15.2 million in July 1942 to an all-time peak of 17.7 million in July 1943. There is reason to believe, however, that the record number of women in the labor force in July of this year is a temporary phenomenon and that in actual fact the rate of increase in the year-round labor force in recent months has been declining. Normally, the labor force in the summer months contains many seasonal workers, chiefly in agriculture, who leave the labor market when the seasonal demand is over. This year, over and above the normal summer increase, there has been an influx of approximately a million or more additional women workers. Much of this influx is due to the above-normal entrance into the labor market of students, many of whom are expected to return to school in the fall. This movement into and out of the labor market is an annual phenomenon, but just as the number taking employment is larger this year due to unusual employment opportunities for young people, the cutback also may be more severe than usual. For this reason, it would be unwise to rely upon all these workers in planning a manpower program.

Employment of Women

What has happened to the female labor force in the past year can best be understood by examining the various fields in which women are employed.

Agricultural employment.—On the basis of national figures, which of course obscure local shortages, the number of women taking seasonal farm jobs has been impressive. Agricultural employment of women in July sustained the level of 2.3 million reported in the previous month and exceeded last year's peak by several hundred thousand. Agricultural jobs are being filled to an increasing degree by women. Their employment constituted 19 percent of the total agricultural employment in July 1943 as compared with 17 percent in July 1942 and 9 percent in July 1940.

Nonagricultural employment.—There has been an almost steady decline in male nonagricultural employment which dropped 2.8 million—from 30.2 million in July 1942 to 27.4 million in July 1943. During this same 12-month period, increases in female employment totalled 2.7 million, leaving total manpower engaged in nonagricultural activities at practically the mid-1942 level. The number of women in nonagricultural employment was 14.8 million in July, and the replacement of men by women raised the proportion of women in nonagricultural industry to 35 percent as compared with 29 percent a year ago.

On the basis of the year as a whole, the net gains achieved in the employment of women in nonagricultural industries seem most encouraging. It should be pointed out, however, that more than one-fourth of the increase occurred in June and July, reflecting the customary employment of

students at this time of the year, and that in the preceding months an ominous leveling off of nonagricultural employment had occurred.

Within the broad category of nonagricultural employment, gains in the employment of women have been registered in all industries, with the most marked shift in work-force composition occurring in manufacturing. In manufacturing establishments covered by the reporting program of the War Manpower Commission, female employment was 16 percent of total employment in May 1942 and expanded to 28 percent by May 1943 (Table 2).

Munitions industries.—Munitions industries especially have been fertile ground for the increased utilization of women, with all war production activities showing higher proportions of women in almost every reporting period (Table 2 and Chart 2). In such industries as ammunition (including bag and shell loading), rubber products, electrical equipment for industrial use, communications equipment, and scientific instruments, women constituted a large percentage of total employment even in May 1942, and in all cases the percentage showed substantial increases by May 1943. In communications equipment, an 18-point rise over this 12-month period brought the employment of women well over one-half of the total work force. As of May 1942 one out of every ten workers in the aircraft industry was a woman. By May 1943 this industry had so increased its utilization of women that the female ratio was close to one out of every three persons employed. Impressive gains in the firearms industry brought the proportion of women to total employment from one-seventh in May 1942 to one-third a year later.

Employing smaller proportions of women, the iron and steel, machinery, and tank industries continued their steady upward trend in the proportion of women employed. Even shipbuilding, which has been among the most conservative industries in the recruitment of women, has evidenced substantial increases in the ratio of female employment. In May 1943, women constituted 10 percent of total employment as compared with 2.4 percent one year ago.

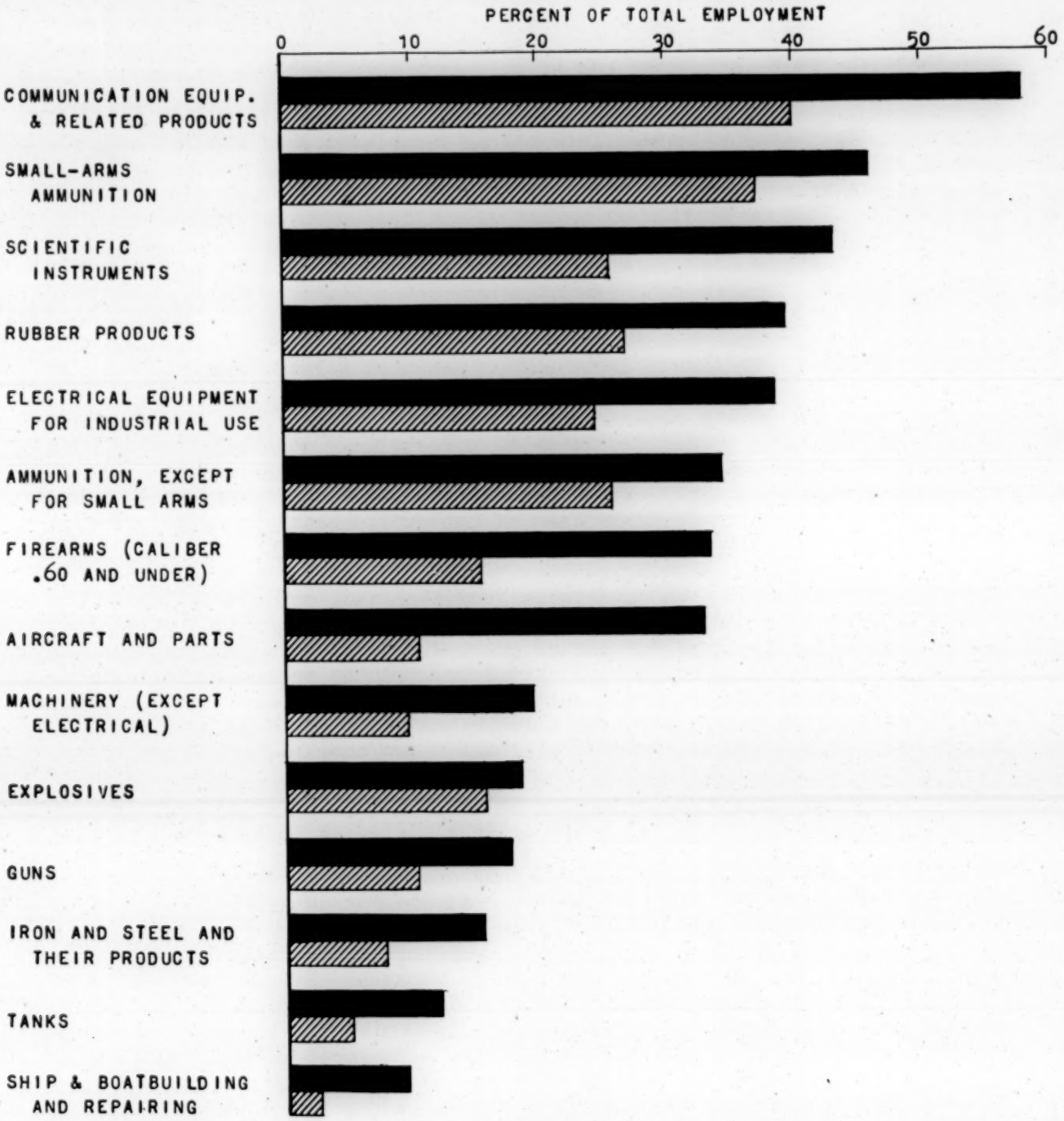
Data describing the national situation conceal marked variations in the extent to which women are being employed within the same industry in different areas. For example, in aircraft, the proportion of female employment in May ranged from 22 percent in Chicago to 45 percent in Seattle; shipbuilding—from 4 percent in Baltimore and Newark to 20 percent in Portland, Oregon; guns—from 8 percent in Pontiac to 35 percent in St. Louis, Missouri; sighting and fire control equipment—from 28 percent in New York City to 59 percent in Cincinnati; tanks—from 5 percent in Berwick to 12 percent in Gary. To some extent these differences can be attributed to the adequacy of the male labor supply that resided within an area or was attracted to an area. This is especially true of industries which were traditionally staffed exclusively by men and where the introduction of women posed some problems. The tendency was and still is to postpone the recruitment of women until no other alternative remains.

Even within areas of acute labor stringency considerable variation in the employment of women exists. Many areas are of a multi-industry nature

CHART 2

EMPLOYMENT OF WOMEN
SELECTED MANUFACTURING INDUSTRIES

MAY 1943 ■ MAY 1942 ▨



WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE
STATISTICS DIVISION

7-2105 P6 nobu

and where there are opportunities for the utilization of women in both the light and heavy industries, it frequently is more desirable to increase the proportion of women in the lighter industries and make as many men as possible available for the heavier ones. In areas where such choice does not exist and shortages of male labor prevail, it becomes necessary to direct women into whatever industrial activity can possibly use them.

Another cause of this variation is the increasing difficulty being experienced in the recruitment of an adequate number of women to meet employer demands in specific localities. Accordingly, if an industry in any one area got off to a late start in its utilization of women, it might find itself faced with a diminishing supply of available female labor. Finally, there remains the attitude of some individual employers, particularly those in heavy industries, who continue to refuse to utilize women on a large scale, disregarding the spectacular changes in the recruitment practices of industry as a whole.

Despite the differential utilization of women within an industry, there is a definite pattern among industries already described in national terms, which is likewise followed at the local level. Consequently, the industrial composition of an area in large measure determines the extent to which women are employed. With manpower shortages now becoming acute and with more controls on in-migration under stabilization plans, fuller utilization of local female labor should result. The severity of local labor shortages will become more important than industrial differences in determining in what capacities and in what numbers women will be used.

Locally-needed activities.—Supporting civilian industries have felt the pinch of manpower shortages most severely. As labor demands for war production outstripped supply and hiring specifications were lowered in these industries, the labor situation in the civilian services became more severe. Women always constituted a high proportion of total employment in trade and service occupations. There is no statistical measure of the current employment of women in trade and service but it is known to have increased in two ways. First, more women are used as replacements for men in occupations in which both sexes were traditionally employed. Secondly, the scope of occupations available to women has been considerably broadened as they are admitted to jobs involving greater skill and responsibility.

Curtailment in employment in trade and service has occurred and further curtailment is anticipated nationally. However, expansion can be expected to take place in a number of areas where heavy in-migration has overtaxed existent facilities.

Industries with unfavorable wage rates such as laundries, dry-cleaning plants, restaurants, hotels, and trade establishments lost their workers in large numbers. Low wages, long hours without provision for overtime pay, and frequently undesirable working conditions prompted workers to seek employment elsewhere. Appeals for workers to transfer from less essential activities to war production gave further impetus to

the voluntary movement out of these industries. To help stabilize employment, certain nonmanufacturing activities are designated as "locally needed." When so designated the activity is given the same status as an essential activity under employment stabilization plans.

The same factors which brought about an exodus of workers from trade and service tended to discourage new entrants into the labor market from accepting employment in these fields with more desirable job opportunities in abundance elsewhere. Housewives who take employment for patriotic reasons cannot readily see the connection between laundering sheets and the war effort. To correct this misconception and to emphasize the urgent need for women in these "unromantic" jobs, the War Manpower Commission and the Office of War Information are sponsoring an educational campaign for the month of September.

Future Requirements

The additional requirements for women are calculated as though all other sources of manpower have been exhausted. Full account has been taken of possible increases in the productivity of labor and in lengthened hours of work. It has been assumed that all available men will have been mobilized for work. The remaining anticipated deficit must be filled by women.

A requirement estimate of this sort is bound to reflect shortcomings throughout the manpower program. Failure of construction employment to decline, poor utilization of manpower working in war plants, or hoarding of labor will be reflected in high requirements for additional women in the labor force. Currently, transfers from employment-declining industries to munitions industries actually have not met expectations. Therefore, if enough women cannot be found to make up the labor deficit thus created in the munitions industries, it should not be inferred that the programs for bringing women into the labor force are necessarily falling short of objectives.

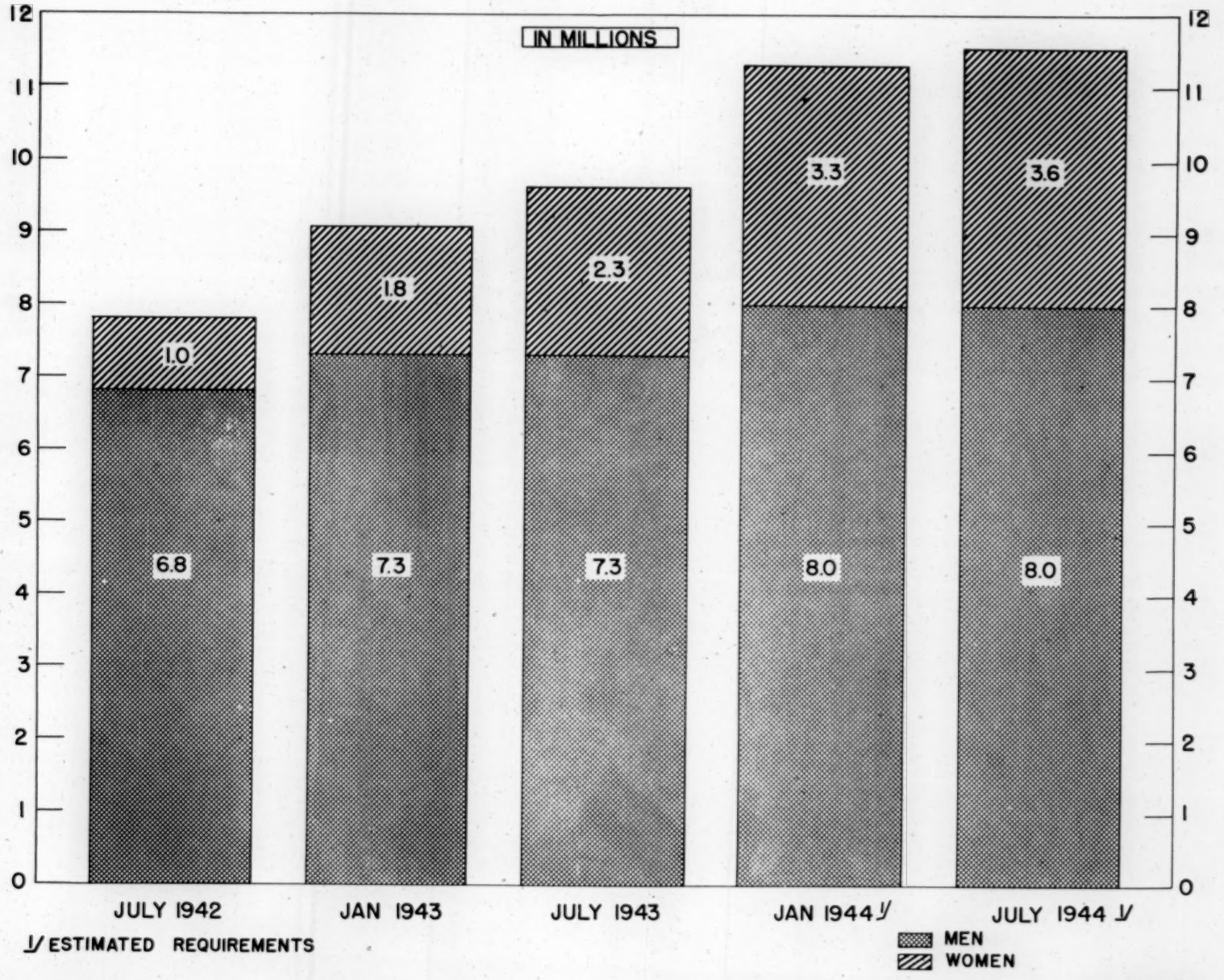
Manpower requirements for the year ending July 1944 show that total employment and the employment of men will decline, but female employment must expand to 18 million with a net increase of at least 900,000 women workers if our manpower needs are to be met. In addition, another 200,000 women must be recruited for the Armed Forces (Table 3). Although unemployment may drop slightly, it cannot be counted upon as a source of workers. Hence, a sufficient number of women must be recruited from outside the present labor force to make possible a net increase of about 1 million.

From July to January, no net increase in the total labor force is required inasmuch as agriculture will fall to a seasonal low during these months. This does not mean, however, that the task of securing an adequate number of women workers will be easy. In fact, the recruitment job to be done assumes almost unattainable proportions when the requirements are examined by broad industrial categories and the magnitude of necessary shifts within the labor force are revealed. Munitions industries, if they are to meet schedules, must expand the employment of women by 1 million

CHART NO. 3

NUMBER OF MEN AND WOMEN EMPLOYED IN MUNITIONS INDUSTRIES

JULY 1942 - JULY 1943



1/ ESTIMATED REQUIREMENTS

WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE
STATISTICS DIVISION

SOURCE: WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE

DEPARTMENT OF LABOR
BUREAU OF LABOR STATISTICS

between July 1943 and January 1944, and by 300,000 from January to July 1944 (Chart 3). An increase of 1 million in these industries exceeds that experienced in any previous 6-month period and is twice the expansion recorded between January and July 1943. Although female employment in agriculture will drop very sharply between July of this year and January 1944, very few of the women currently working at seasonal jobs on the farms will become available for munitions employment when no longer needed in agriculture. Other industries are expected to yield only 100,000 workers as a result of curtailment by January 1944. It may be necessary, therefore, to recruit almost a million net additional women workers from outside the present labor force to meet the January requirements for nonagricultural employment.

In terms of the expansion already accomplished, increasing the female labor force by 1 million appears not too formidable (see Chart 1). Actually, there is little likelihood of meeting this goal unless the declining rate of increase in the female labor force experienced prior to the temporary June upswing is reversed. Net increases of necessity seriously understate the magnitude of the recruitment task which lies ahead, inasmuch as they make no allowance for the number of women who must be recruited to replace those who leave the labor market. Even under normal circumstances, a sizable part of the female labor force is composed of marginal workers who are attached to the labor market temporarily or intermittently. This pattern of entering and leaving the labor market is not only continuing but is being accentuated under wartime working conditions. With no domestic help available, inadequate child-care facilities, shopping and marketing difficulties, all throwing tremendous burdens on the housewife who has taken employment, industry is having increasing difficulty in retaining its female work force. Since employment stabilization plans do not control movements out of the labor market, the exodus of women from the labor market is unchecked.

A second factor which magnifies still further the problems of meeting requirements is the localized nature of the demand which is largely concentrated in areas of labor stringency. In many shortage areas those women who could readily be drawn into the labor market are already employed, and even intensive recruitment may not be able to yield an adequate number of additional women. At the same time, other areas with considerable numbers of potential female workers lack employment opportunities.

Labor supply.--It has already been pointed out that to meet requirements women must be recruited from outside the labor market, since neither the decline in agricultural employment nor the reduction in the number of unemployed can be counted on as a source for year-round workers. Curtailment in industries other than munitions at best will yield 100,000 women by January and perhaps 300,000 more by July 1944.

A substantial contribution to the labor force has already been made by the youngest age group available for employment (14 - 19 years), which consists largely of students. By April 1943, the actual female labor force within these ages had exceeded the estimated normal labor force by close

to one-half million, and it is questionable whether this trend can or should be expected to continue (Table 4 and Chart 4). It is estimated that over one-fourth of the abnormal wartime increase in the female labor force consisted of girls under 20 years of age.

Practically no net expansion occurred among women between 20 and 30 years of age, and only a 6 percent increase of actual over normal employment is estimated for women in the next 5-year bracket. The insignificant net gains in the work force of women between the ages 20 and 35 may be attributed to the fact that many of the women not employed have child-care responsibilities. In addition, the normally high work rates among women in these age groups would make further gains more difficult to achieve. Until recently, the liability of husbands to the draft may have also acted as a check upon their entrance into the labor force. The first two factors will probably continue to restrict expansion in the female labor force within these ages.

Traditional age specifications will impose some limits on the use of older women as will their employability. Nevertheless, women over 45 years of age have been absorbed in employment to such an extent that it is estimated their actual numbers currently in the labor force are 20 percent above what they would be normally. The full utilization of this reserve is important since older women are unlikely to be encumbered with child-care responsibilities.

At present, the most readily available group consists of nonfarm housewives between the ages of 20 and 55 without children under 16. This group as of April 1943 numbered 5.6 million which on a national basis appears to constitute an adequate reserve of potential women workers. However, in view of the localization of demand and the completely voluntary basis of recruitment, there is no assurance that an adequate number of women will enter the labor market where they are needed.

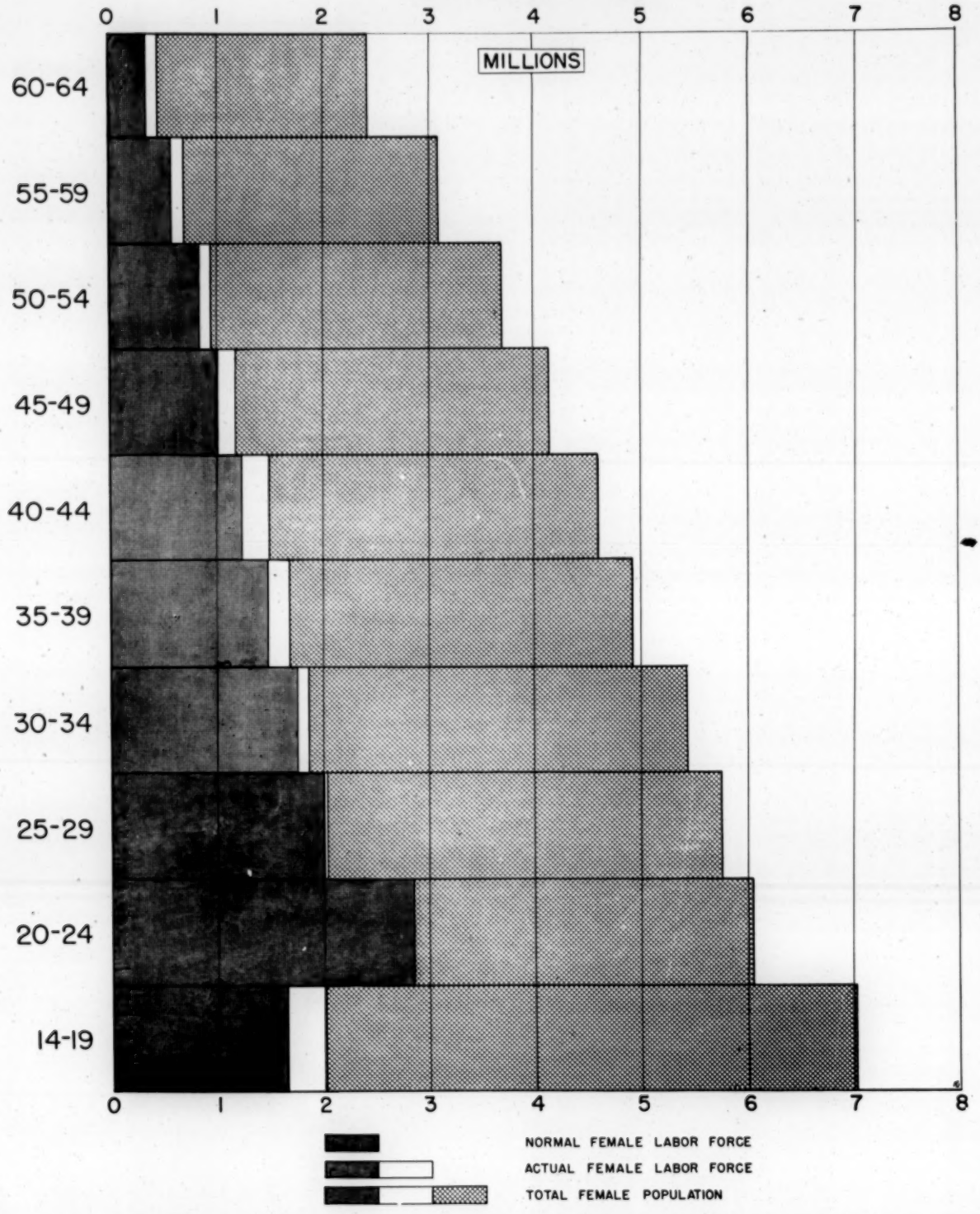
A growing tendency to increase part-time employment will offer employers a potential supply of labor which might not be available otherwise. Trade and service has always used large numbers of women for part-time work, and this practice has increased with growing labor stringencies. Manufacturing industries have also recently initiated part-time work schemes which are proving successful. Female part-time workers, many of whom are housewives and some employed white collar workers have been used in light assembly work especially in communications equipment and aircraft parts establishments in New England and on the West Coast. Throughout the country, women are being recruited for part-time as well as full-time employment to meet the seasonal needs for harvesting crops and canning food products. Women who cannot adjust their other responsibilities to permit full-time employment without assuming an unreasonable workload should be channelled to whatever part-time employment opportunities are available in the community.

CHART NO. 4

FEMALE POPULATION, NORMAL & ACTUAL LABOR FORCE

APRIL 1943

14-64 YEARS OF AGE



WAR MANPOWER COMMISSION
REPORTS & ANALYSIS SERVICE
STATISTICS DIVISION

SOURCES: REPORTS & ANALYSIS SERVICE – WAR MANPOWER COMMISSION
BUREAU OF LABOR STATISTICS

Recruitment

In the course of the past year and a half the War Manpower Commission through its local United States Employment Service offices has conducted intensive recruitment drives in quite a number of areas. These campaigns, frequently undertaken with the cooperation of civic organizations, have ranged from publicity of an educational and informational nature to voluntary enrollment campaigns which aimed to register all women in an area. These efforts have met with varying results according to the effectiveness of the publicity, timing, and planning which preceded the actual recruitment drives.

House-to-house canvassing has been attempted. These efforts have often been disappointing because too much responsibility was vested in inadequately trained volunteer workers, usually from Civilian Defense organizations. From limited experience, it appears that house-to-house canvassing by a recruitment staff made up of local office personnel is far more effective although also more costly. Special recruitment centers located in the heart of shopping districts have been established in several cities. Itinerant recruiters have been used in an attempt to staff plants within feasible travelling distance of outlying communities. This technique has been resorted to rather widely in recruiting workers--both men and women--for seasonal employment in agriculture and canning.

Unquestionably, far more women have been recruited into the labor market than net increases in the labor force reflect. Some movement out of the labor market cannot be avoided, but a considerable amount of this turnover might be eliminated. Recruitment activities will not produce the necessary net increases unless greater stabilization of the female work force is accomplished.

Plant and community services and facilities.--If continuation on the job and regularity of attendance is to be effected, greater consideration must be given to the special problems confronting employed women. This is particularly important as regards women with household responsibilities who have no previous work experience, since their employment involves the most difficult readjustments. In addition to appropriate induction, training, and orientation to the job--important for all new workers--adaptation of plant and community facilities and services bear a direct relationship to the stabilization of this group in the female work force.

Industrial medical programs must emphasize new aspects of medical care as increasing numbers of women go to work. Preemployment or preplacement examinations are essential for the proper assignment of women to work which they are physically capable of handling. Our concept of suitability of jobs for women has been so broadened within the past few years that women are now working in many occupations which would not have been considered suitable for their employment prior to the appearance of labor stringencies. Although women can perform in such capacities, the need

for more selective placement becomes apparent with the increased utilization of women in jobs far removed from their normal occupations. Machinery should be devised for the transfer of workers who may be misplaced in their first assignments.

Adequate meals served in the plants have a definite effect on the productivity and morale of workers. In addition, the availability of a well-balanced nourishing meal in the establishment simplifies the preparation of meals consumed at home.

Plant management has become increasingly aware that counselling services particularly for women workers assist in resolving personal difficulties connected with adjusting to a work situation or in satisfactorily solving problems which make continuation of employment difficult. However, far too few personnel departments are prepared to provide such service at this time.

Communities must act to assure the sufficiency and availability of child-care facilities. Although it is the policy of the War Manpower Commission not to recruit women with young children, many mothers have of financial necessity or of their own volition entered the labor market. At present child-care facilities are inadequate in stringent labor market areas. With the drafting of fathers imminent, the need for such provisions will increase. The passage of the Thomas Bill now pending in Congress should provide the means for a more rapid solution of this problem.

Throughout the country individual communities have adopted evening shopping hours. In some plants, the establishment of branch stores on company property has obviated the need for taking time off to make purchases.

A beginning has been made by plants and communities in the adjustment and expansion of the services and facilities so essential to the employed woman. However, much more remains to be done along these lines, since future recruitment will draw most heavily on housewives.

Impediments to the further recruitment of women and to the retention of women already employed are numerous. They concern the community and its attitude toward the employment of women as well as its action in providing the types of services which will make it more possible for housewives to work. They concern husbands and other members of the family and their willingness to share household responsibilities. They concern industry and its disposition not only to relax hiring specifications to permit the full utilization of women but to arrange hours and shifts which will cause least inconvenience to women with other responsibilities. They concern trade unions and their willingness to set aside seniority rules which impede the employment of women on jobs and shifts in which they can best be used. And finally they concern women themselves and their readiness to recognize the urgent need for their services.

War Manpower Commission
Reports and Analysis Service

Table 4.--Estimates of female population, normal and actual labor force, April 1943

14 - 64 years of age

(In thousands)

Age Group	Population	Normal labor force	Actual labor force	Excess of actual over normal	
				Number	Percent
Total....	47,371	13,851	15,430	1,579	11.4
14-19..	7,099	1,647	2,096	449	27.3
20-24..	6,055	2,852	2,855	3	.1
25-29..	5,766	2,023	2,025	2	.1
30-34..	5,430	1,750	1,862	112	6.4
35-39..	4,980	1,494	1,685	191	12.8
40-44..	4,560	1,263	1,528	265	21.0
45-49..	4,169	1,037	1,237	200	19.3
50-54..	3,742	838	965	127	15.2
55-59..	3,108	583	707	124	21.3
60-64..	2,462	364	470	106	29.1

Source: Bureau of Labor Statistics

R7.11

WOMEN IN WAR - 1943 By Federal Bureau

pp. 89, 91, 93, 97, 100-104

Service Publishing Co. N Y City

Everyone agrees that the major source of new workers in 1943 and 1944 will be women. We have already virtually exhausted the supply of males. More than 80 per cent of our men over 14 years of age were in the labor force (which includes the fighting forces) when war broke out. Of the remaining 20%, or approximately 8,400,000, 4 million are between 14 and 19 years of age and are normally at school. Two million, five hundred thousand are 65 and over; 1.8 million are physically or mentally handicapped. It is obvious that by 1943, available man power in non-defense industries will be exhausted and women will be called upon to keep the machines running.

It is estimated that something like eighteen million women must be employed at the end of 1943, and probably twenty million in July, 1943 when the need for farm labor is at a peak. These new women workers will be women who have not been gainfully employed before. As the needs develops in some localities and war industry expands many of these women workers will be housewives and mothers of children under 16....

At the close of the war in 1918, women had invaded every major war field. Thus, in aircraft and metal production, 18% of all workers were women; in optical goods manufacture, 37%; in rubber goods, 35%; in photographic supplies, 35%; in leather goods, 33%; in electrical goods, 27%; in chemicals and allied products, 14.2%; in metal products (other than iron and steel) 17.8%; scientific and professional instruments, 17.1%; stone, clay and glass products, 15.5%. In November, 1918, 1 out of every 5 war workers was a woman. In 1943 1 out of every three war workers must be a woman. To reach the proportion of 1 to 3 practically every able-bodied woman will be called to work in some war or allied industry....

A very definite step forward has been made to mobilize woman labor. Before war broke out, the National Labor Supply Committee, established a sub-committee consisting of Miss Mary Anderson, Director of Women's Bureau (U.S. Labor Department), Mrs. Nellie Miles of the United States Employment Service and Miss Thelma McKelvey, then a member of the Labor Division of the OPM and now with the War Manpower Commission. This new committee was organized to suggest measures for the greater utilization of women in war work. On September 2, 1942, Paul V. McNutt, Chairman of the War Manpower Commission, appointed a Women's Policy Committee to aid in training and recruiting women in war work. This committee is headed by Miss Margaret A. Hickey. These and other agencies are drafting measures to encourage the entrance of women into war work....

Many women will have to manage households in addition to working eight hours a day. Arrangements must be made to provide them with shopping, recreation and other facilities in their off hours. Women assigned to night shifts will be confronted with a whole field of special problems....

In general, women have special capacities for work requiring "feel," that is minute assembly work and adjustments. Women are especially capable in grinding where fine tolerances are necessary. The 480,000 women in war work early in 1941 were employed as follows:

46,000 in iron and steel;
54,000 in machinery manufacturing;
5,000 in aircraft;
14,000 in rubber;
95,000 in textiles;

16,000 in chemicals
31,000 in non-ferrous metal; and the balance in paper, leather, automotive manufacture and food. These are the principal and key war industries in which women will be employed in increasing numbers.

...in the aircraft factories during the first quarter of 1941, women comprised 2.6% of all new workers hired; in the last quarter of 1941, the percentage rose to 7.7%. In the first quarter of 1942, the number of new jobs in occupations now employing women rose to 15 women out of every 100 hired. And 23 out of 100 new employees in occupations in which women were not then working, will be women.

Enormous advances in the proportions of women to be employed in 1943 were foreshadowed by preliminary results of a questionnaire submitted to 1,000 management executives by the magazine, Modern Industry. Exclusive of office employees, the sampling of the Aviation Industry showed 1 percent employed in 1941, 15 percent being employed in 1942, expectation of 65 percent to be employed in 1943; in the Electrical Industry, the percentages ran 6 percent in 1941, 9 percent in 1942, an anticipated 35 percent in 1943; in the Instrument Industry, 10 percent in 1941, 35 percent in 1942, anantanticipated 60 percent in 1943; in the Pharmaceutical Industry , 45 percent in 1941, 55 percent in 1942, an anticipated 75 percent in 1943; in the Tool and Die Industry, 2 percent in 1942, an anticipated 20 percent in 1943; Hosiery, 65 percent in 1941, 75 percent in 1942, and anticipated 80 percent in 1943.

Industrial Chemical:

In industrial chemicals, for the first quarter of 1941, women were given 7.6% of all new jobs while in the last quarter of 1941 the percentage rose to17.7%.

Ordnance:

Early in 1942, there were 80,000 women employed in ordnance factories as compared to the 300,000 who were employed by the end of 1942.

Managerial jobs

In 1941, the number of managerial and professional jobs given to women rose from 20% to 29% of the total number of jobs filled....

In a recent report by the Office of War Information it was disclosed that in 1943 at least 29% of the female population (as compared to the present 23%) will be working. That will bring up the total of women workers from 15 million to 18 million and with 6 million in war, 30% of our expected/labor force will be women. And many women will will invade new fields. The trend is already apparent. Thus, at the Army Air Force's Ellington Field--the largest flying school in the world--women work as mechanics installing parts of planes, making repairs, maintaining and inspecting planes and parts.

Aircraft Assembly

In 1941, only 2,000 women were employed in aircraft assembly plants; in 1942, one plant alone, employed 5,000 women in sheet metal work, as riveters, welders, assemblers, and inspectors. In August, 1942, there were 50,000 aircraft workers and

by the end of 1942, some 250,000 women were working in aircraft assembly plants. The work they are doing is light assembly work on wings, fuselages and control surfaces; they rivet, drill, file and remove metal burrs from machined parts. And some women will be promoted to managerial and supervisory positions.

Employment figures for 1941-1942 will be dwarfed by those for 1943. And the various types of occupations in which women will br found defies accurate description. And it is impossible to catalogue all the jobs. In 1918, there were 100,000 separate and distinct occupational items. The likelihood is that the number of job items in 1942, 1943 and 1944 will far exceed the 100,000 figure.

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THE PUBLIC LOOKS AT MANPOWER PROBLEMS

Surveys Division

Memorandum No. 43

Study planned and summarized by the Surveys Division
Bureau of Intelligence, OFFICE OF WAR INFORMATION
in collaboration with
The National Opinion Research Center
of the University of Denver

January 5, 1943

8402

FOREWORD

This study is based on 3619 personal interviews made with a representative cross-section of the American public. Interviewing was conducted from October 22 to November 6, 1942.

8402

THE PUBLIC LOOKS AT MANPOWER PROBLEMS

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S U M M A R Y

Public Awareness of Shortages

In October the public was already sharply aware that the nation faced a crisis in obtaining farm labor, but was not yet deeply disturbed about existing scarcities of industrial manpower. Almost all (86%) thought farmers could not get all the help they needed, but only a third said that war plants were having such difficulties.

The uneven and sporadic nature of labor shortages in October seemed to account largely for public failure to get more excited about the situation. For example, those living in the Northeastern part of the U. S., where the personnel requirements of war production have pinched most, showed high awareness that shortages already exist in some areas.

Apparently two of the most important informational tasks facing WMC are (1) to continue explaining that serious scarcities of labor, if not already here, are just around the corner; and (2) to vivify for people in areas not touched by war manufacturing the problems faced by war plants in booming production centers. This survey shows that recognition of such problems is vital to build maximum public support for employment of women in war industry and for the use of compulsory measures to recruit needed workers.

Labor Force versus a Larger Army

Though the public was not yet upset over the lack of war workers, they have always attached the utmost importance to the role of production in our war effort. And on this survey, when presented with a choice between the possible alternatives of building up either our armed forces or our labor force, a slight plurality favored increasing the labor force.

The bare necessity of increasing our production thus supplies the most powerful kind of motivation for a WMC campaign to expand the labor force.

There remains much to be done not only in describing the nature of existing and impending labor scarcities, but also in tearing down prejudices against employment of aliens, Negroes and women in manufacture of military materiel.

Employment of Aliens

The most important of these is against the employment of aliens. Two thirds turned thumbs down on a proposal to permit aliens to work in war industries. The possibility that machinists and other sorely-needed skilled workers may be found in the ranks of this group underlines the need to sell people the idea that most aliens are loyal and useful.

Employment of Negroes

Only a third of the public opposed the idea of giving Negroes equal access to good war jobs, while more than half approved. There is evidence, however, that deep-rooted general prejudices against employment of Negroes have changed very little since last June. Thus, people were no more inclined in October than in June to approve employment of Negroes in the places where they themselves work. Also, Negroes today seem to be employed mainly in unskilled and service jobs with which many people usually associate them. If they are to have opportunities for promotion to more skilled levels, it seems important to continue demonstrating that they can learn higher skills and to advocate that more of them be given the chance to prove it.

Employment of Women

The task of stepping up the flow of woman-power into war industries presents a completely different problem. There is very little public opposition to employment of married women without children, although the public draws the line sharply at hiring mothers. But, while most aliens and Negroes are undoubtedly anxious to find war jobs, the majority of women not at work believe they can contribute most to the war effort by continuing their present activities. This sentiment is much stronger among mothers than among women without children. Large groups of almost all women believe that transfer into war jobs would dislocate family life, and mothers are particularly disturbed about providing care for children.

All this evidence re-emphasizes the fact that in any attempt to recruit women workers a basic consideration is the family responsibility of each individual. Nursery schools and play centers which can command the complete confidence of mothers are an absolute necessity if many of this group are to move from home to factory.

Workers from Non-Essential Industries

A fourth group which must be tapped for additional labor supply is the large body of workers in non-essential industries. Undoubtedly motivated by the lure of higher pay as well as patriotic impulses, a majority of those working for someone else showed no resistance to switching jobs, and almost half thought such a change would create no personal problems. Self-employed people were more reluctant to change over, many because they feared they would lose their businesses. Long years of service, high satisfaction with pay, and employment in highly-skilled occupations all tend to retard willingness to shift jobs.

The majority of working people see themselves as most useful in jobs closely related to their present occupations. This fact points up the need for adequate training facilities. Extension of these facilities will need to be supplemented by measures designed to reduce personal confusion involved in changing jobs and to smooth the flow of green labor into a production machine running at top speed.

How to Get a War Job?

Many who stated that taking a war job would cause them no difficulty reported that they did not know how to go about applying. Over two thirds of those who had taken no steps toward securing a war job were not aware that USES was available to facilitate job shifts.

Obviously no voluntary program can hope for success until the public is better informed regarding the need for shifting into war industry and the means by which the shift can be made.

Acceptance of Compulsion

But the Truman, Tolan, and WMC Labor-Management Policy Committee have all insisted that voluntary expedients be exhausted before widespread compulsory measures are adopted. The first two groups and the newspapers have also shown considerable dissatisfaction with the way WMC has handled its job. A lukewarm press reaction to the December 5 reorganization brought into sharp focus the fact that criticism was aroused not only by the lack of organization among manpower agencies, but also by the absence of firm administration and a well-planned program.

The public itself has shown approval of the principle of compulsion since early 1942. In October three-fifths thought the Government should move workers from non-war to war jobs, two-thirds okayed freezing workers in war jobs, and five-sixths said that people should be taken out of non-war jobs and put to work on farms next Spring and Summer. But the public also has attached some strings to its approval. It has demanded, for example, that compulsion must have "fair, firm, and efficient" administration under a top-notch leader. And it wants rules and regulations clearly and convincingly explained.

THE PUBLIC LOOKS AT MANPOWER PROBLEMS

"In order to keep stepping up our production, we have had to add millions of workers to the total labor force of the nation. And, as new factories come into operation, we must find additional millions of workers . . . we are learning to ration materials; and, we must now learn to ration manpower . . .

It may be that all of our volunteer effort, however well-intentioned and well-administered, will not suffice to solve the problem . . . the successful operation of the Selective Service System and the way it has been accepted by the great mass of our citizens gives us confidence that if necessary, the same principle could be used to solve any manpower problem."

. . . . . President Roosevelt in his fireside chat on Columbus Day: October 12, 1942.

INTRODUCTION

Since the end of summer, the shortage of manpower has grown into one of the nation's most threatening problems. The mushrooming war effort of the United States has made great demands on our manpower and womanpower resources which may be summarized as follows:

1. The administration has set as its goal: seven million men in the armed forces by the end of 1942, almost ten million by the end of 1943.

2. Employment in war production must climb to 17½ million by New Year's Day; and, to more than twenty million by January 1, 1944.

3. Farmers are being asked to grow more food than ever before, even though much of their labor supply has been drained off into the armed services and war plants.

4. Essential civilian industries and services must be kept in operation, while an estimated 8 million new workers are being added to war industry.

The approaching crisis has been much discussed. One after another, reports of special governmental groups -- War Manpower Commission's Labor-Management Policy Committee, the House of Representative's Tolan Committee and the Senate Truman Committee - have beckoned public and official attention to the crucial nature of this problem. They have traced causes and posted recommendations. The press itself, during the autumn months, devoted as many of its columns to this issue as to almost any other topic on the home front. On December 5, 1942, President Roosevelt climaxed this train of events by stripping governmental machinery for action with an order strengthening and broadening the power of the WMC.

The revitalized organization stands on the threshold of a job which is as essential to our speedy victory as control of the air. In performing its job, the WMC will affect the lives of millions of people. Like Selective Service, its decisions will dislocate the daily existence of some, yet never touch others. Strong public support and an understanding by government officials of the public's point of view would seem to be invaluable for the success of the task ahead.

How do people feel about the general manpower situation? Which types of men or women are most receptive to job freezing, or to change from civilian to war work, and which will resist such changes most strongly? What problems does the average man face in changing from job to job? Will he be convinced that the sacrifices he may be called on to make will be necessary?

In a nation-wide Bureau of Intelligence poll conducted from October 22 to November 6, and in a number of other special surveys the Bureau has attempted to get the answers to these and related questions.

This information is presented in the following pages. The results summarized here do not present a complete picture of attitudes toward manpower mobilization, but they should be of assistance in solving the knotty problems which will confront the WMC in coming weeks.

The Government's experience with other forms of rationing has demonstrated that public understanding and support is a sine qua non for cooperative acceptance of measures demanding such fundamental sacrifices. How, then, do the people regard the present manpower situation?

I. AWARENESS OF MANPOWER SHORTAGES

Americans apparently do not believe that the industrial manpower shortage has reached a crucial stage. The shortage of farm workers, and not the prospect of labor scarcity in war plants was the manpower problem causing the gravest concern at the time of the survey. Perhaps aware that farmers needing workers have been pushed to the wall by competition from war industries and a lack of preferential draft treatment for farm laborers, the public almost unanimously recognized the existence of a farm-labor shortage. Only a third, however, conceded that manpower was a real problem for war plants.

> From what you've heard, do you think war plants in this country can get all the workers they need now?
> How about farmers in this country? Do you think farmers can get all the workers they need now?

	Farmers	War Plants
Can get all the help they need.	9%	57%
Cannot get all the help they need	86	33
Not ascertainable.	5	10

The public's pre-occupation with the farm-labor shortage reflects a similar tendency in the American press. Analysis by the Bureau of Intelligence, Media Division over an eleven-week period in August, September and October, shows the issue of manpower receiving widespread discussion in newspapers, and the great majority of attention was directed to the farm shortage.

Field observers throughout the United States reported in October that farmers attribute the shortage not only to lack of deferment for agricultural workers, and competition of war plants, but also to the lure of naval-enlistment campaigns. These observers point out that deferment and freezing steps already taken by the WMC may not provide a complete solution for the problem. In small Iowa farm communities, for example, deferment often brings personal criticism and many youths are inclined to refuse it even when it is granted.

Other suggested solutions of the problem are adjustment of the differences in farm and war plant wages, importation of Mexican labor, employment of local citizens to meet peak seasonal demands, and use of Japanese labor from relocation centers.

> Whatever the solution, and the manifold problems inherent in any of the suggested remedies are apparent at a glance, there can be little doubt that the general public is gravely concerned about the farm shortage. Firm public support for a constructive program to alleviate this situation seems assured.

Similar support for drastic measures to solve industrial manpower shortages is, at the least, questionable. The reasons for the public's failure to take more seriously the personnel scarcity in many war plants are not entirely clear.

Probably the principal explanation lies in the fact that the labor shortage is extremely uneven. It is often rigidly stratified into demand for a small number of specialized skills. Futhermore, a glance at the recent maps of the Bureau of Employment Security will show that the severest deficiencies of industrial manpower are spotted in a small number of booming production areas, mainly in the East and Midwest. Implications of impending scarcities are perhaps beyond the limited and localized conceptions of many persons who have had no contact with actual shortages. Moreover, it is common knowledge that high wages, preferential draft treatment and also a certain amount of patriotic prestige have made factory employment very desirable. These considerations probably strengthen the belief that war plants are in good shape, so far as personnel needs are concerned.

Some of these factors were reflected in the vote of various groups on the issue of a current manpower scarcity. Thus, persons in the worst areas - Easterners, Midwesterners and Far Westerners - were more concerned about a lack of factory workers than persons in other regions.

	War Plants Cannot Get Needed Workers
New England	48%
East North Central	39
Middle Atlantic	38
Pacific	36
Mountain	32
West North Central	26
Southeast	24
South Central	20
Southwest	20

Also among workers, A. F. of L. unionists (generally comprising more skilled workers than the C.I.O. membership) are most alert to the stringencies of the present situation, perhaps because the need for skilled workers is particularly acute. Almost half of the A.F. of L. members, but only a third of the C.I.O. and non-union members feel war plants could not get workers.

A majority of all occupational groups denied that factories were suffering from personnel shortages. But semi-skilled and unskilled workers, who constitute a considerable part of the total industrial personnel, are less aware of the labor scarcity than almost any other group. This may reflect a reaction to wastage, or hoarding, of labor in war plants. Possibly because they are well informed, or because they have faced many

serious problems growing out of the shortage, professional and managerial people in war industries most often recognize that deficiencies exist.

	Think war plants cannot get all the workers they need.
Professional and managerial workers	
In war industries	41%
Not in war industries.	36
Clerical workers	
In war industries.	39
Not in war industries.	38
Skilled workers (almost all in war industries)	35
Semi-skilled workers	
In war industries	32
Not in war industries.	26
Farmers.	24
Miscellaneous.	25

The well informed people are most cognizant of the fact that some plants are already in a tight spot. Thus, there are considerable differences between educated and uneducated people on this issue, as follows:

> 43 per cent of the college graduates, but only 22 per cent of those with some grammar schooling only, say that war plants cannot get all the workers they need.

It is interesting, however, that a majority of people on all educational levels thought war plants could get necessary help.

From all this evidence, it is apparent that much informational work still needs to be done. The public is not staring straight in the face of an impending acute shortage, as those on the inside are. Perhaps the man in the street does not yet realize what is coming. In any case attention of all groups should probably be directed to the serious situation already existing in some areas.

It seems essential to vivify for people whose life goes on as usual the problems faced by war plants in overcrowded production centers. They must also be convinced that these problems will multiply during coming months unless new workers are recruited to expand the labor force and replace men going into service.

The importance of this task is sharply pointed up by the present survey. Failure to recognize even the limited shortages existing in October, as we shall see in a moment, tended to restrain the sentiment for compulsion, and to retard acceptance of the proposition that women are now needed in war industries.

II. THE IMPORTANCE OF PRODUCTION IN THE WAR EFFORT

Fundamentally, the public is not underestimating the role of industrial production in our war effort, nor the need for an adequate supply of war labor. The concept of the "arsenal of democracy," promulgated by the President in pre-Pearl Harbor days, has been hammered deep into the consciousness of Americans, and at the time of the survey they felt by a slight plurality that it was more important to build up our labor force than to increase the size of our armed forces.

The public was asked, "Granting that both of these things are important, which one is most important for us to do right now -- increase the size of our armed forces, or increase the number of workers in war jobs?" Interviewers reported much hesitation on the part of many respondents, but the final vote was:

40 per cent said that it was more important to increase the number of workers in war jobs.

22 per cent said it was more important to increase the size of our armed forces.

25 per cent said the two were equally important.

13 per cent were undecided.

This result is only one of many indications of the pride Americans take in our war production; they have always viewed most optimistically its importance in our effort. For example, on previous surveys by the Bureau of Intelligence, majorities have indicated their belief that the United States is producing over half of the Allied war material, and also that American equipment is superior to that of other belligerents.

> These attitudes can probably furnish a favorable background for a campaign urging workers to take war jobs, once the people understand that production may suffer unless more workers are enlisted.

People will, of course, go to even greater lengths when they are concerned about the progress of production. Thus, those who registered dissatisfaction with our present rate of production were more often insistent about expanding our labor force than were those who expressed satisfaction with conditions in this regard.

	Believe production is going along:	
	Very well	Fairly well or Poorly
Increase armed forces	24%	21%
Increase number of workers. .	37	47
Both equally important. . . .	26	24
Don't know	13	8

Significantly, the informed opinion was also strongly on the side of an expanded working force. In fact, as the educational level goes down, there is almost step-by-step decrease in the vote for a larger labor force rather than a larger armed force.

	Increase Armed Force	Increase Labor Force
College graduates	49%	19%
Some college	41	18
High school graduates	41	22
Some high school	43	21
Grammar school graduates . . .	39	20
Some or no grammar school . . .	33	27

There was, however, no difference in this respect, between those who thought the war would be long and those who thought it would be short, and only slight differences between those thinking war plants can get all the workers they need and those thinking war plants cannot.

Differences between the various occupational groups and between men and women were also negligible.

III. EXPANDING THE LABOR FORCE

American enthusiasm for production as a short cut to victory can probably be used to help tear down much of the prejudice against Negroes, women, and aliens, three groups not yet fully amalgamated into the labor force.

The need for full employment of these groups will increase sharply as the shortage begins to tighten its stranglehold on production, and intensive efforts have already been made to obtain their more effective utilization.

In his Columbus Day speech, the President said, while discussing manpower:

> "In some communities employers dislike to hire women. In others they are reluctant to hire Negroes. We can no longer afford to indulge such prejudices."

Employment of Negroes

In a great many cases, the President's demand for wider employment of Negroes has fallen on barren ground. Last June and also in October people working for someone else were asked whether Negroes actually were employed in their companies, and also whether Negroes should be employed. Opposition to hiring of Negroes in their own establishments has risen slightly since last June, particularly among people whose employers now have all white help.

	Total		People working in places which Do hire Negroes		Do not	
	June	Oct.	June	Oct.	June	Oct.
Should hire Negroes where respondent works	61%	56%	88%	91%	31%	24%
Should not	31	39	9	8	60	68
Don't know	8	5	3	1	9	8

Note the tremendous differences between people already working with Negroes and those who are not. These differences have become even more extreme over the five-month period. Possibly these results represent a *fait accompli* tendency among the public - an inclination to reconcile themselves to the event after it has taken place. It may be also that association with Negroes has convinced some people of their ability to do the job. The problem is complicated further by the kinds of jobs given Negroes. If they are given menial tasks they are not as threatening to the whites as if given better jobs. Fear of competition may be greater in plants not yet hiring Negroes.

Some encouragement can be derived from the fact that both last June and in October a considerable majority of the total working force favored employment of Negroes in their own places. This is true for all sections of the

country. In fact the slight drop in approval was distributed evenly among Southern, Eastern, Midwestern and Western areas. It is notable that on both polls Southerners, living in deep-rooted traditions of white supremacy, still favored hiring of Negroes in their own establishments, although not by so large a majority as in other sections.

For example:

53 percent of the Southerners, but

64 percent of the Easterners said in October that their establishments should hire Negroes.

It should be remembered, however, that many places which hire Negroes, employ them only in jobs requiring limited skill. Doubtless, some respondents have this in mind when asserting that their establishment should hire Negroes.

In fact one of the major problems in realizing the full potential of Negro labor is to find ways of giving them an even chance for obtaining good war jobs, and advancing in those jobs once they get them. The present survey shows that almost all Negroes are at work, but an abnormally large number are employed in agriculture and service industries. Negro women particularly are apparently working at little besides cooking or other domestic jobs.

The following table shows the employment of white and colored people and also the occupations at which they report that they are working:

	White		Negro	
	Men	Women	Men	Women
Total employed	91%	22%	88%	50%
Total not employed	9	78	12	50
Occupations				
White-collar, both upper and lower	43	69	15	11
Skilled labor	14	2	9	-
Semi-skilled and unskilled . . .	21	23	46	73
Farm	21	6	29	16
Other	1	-	1	-

About half of the Negro men and most of the women doing unskilled and semi-skilled labor were service workers.

White people were well aware (70%) that Jim-Crow ideas lock the Negroes out of many good war jobs; but, the majority (54%) favored giving the Negroes an even break. A third of the white public, (35%) however, opposed removing this discrimination. It is notable that this result closely parallels the vote among workers in favor of having their companies employ Negroes. The following question was put to the entire public. The results for white respondents are shown below: (Note that those believing Negroes <u>have</u> good opportunities to get war jobs are relatively more partial to the Negro cause than those who do not think so.)

> In general, do you feel that right now Negroes have an equal chance to get <u>good</u> war jobs, or do you think white people usually have the best chance?
>
> Do you think that is the way it ought to be? (Asked of all white people, except those saying, "don't know.")

Negroes have equal (or better) chance	23%
Should be that way	16%
Should not	6
Not ascertainable	1
Whites have best chance	70%
Should be that way	29%
Should not	38
Not ascertainable	3
Not ascertainable whether whites or Negroes have best chance	7%

Again Southerners were more opposed to a grant of equal job opportunities to Negroes

> 55 percent of the Southerners, but only
>
> 35 percent of the entire public thought Negroes should <u>not</u> have an equal opportunity with whites to get good jobs.

In a survey of shipyard workers in two Southern and three Northern yards, Southern white workers also took a relatively strong stand against giving Negro workers access to the good jobs. More frequently than their Northern co-workers they wanted to relegate colored workers to inferior positions, and they were also much more strongly for segregating Negroes in Jim-Crow shops or departments. In <u>all</u> yards, however, only a very small number were unconditionally opposed to the employment of Negroes.

In the North, <u>uneducated people</u> in the general public held most tenaciously to the prejudice that Negroes should not have equal opportunity for good defense positions. People with little schooling probably include the largest groups on a competitive level with Negroes, and this fact may help to

account for their stronger prejudice. Note in this connection that a relatively large proportion of the uneducated people believe Negroes are already granted equality of opportunity:

How Negro chances for good war jobs compare with white people's chances	Northern Respondents: College Graduates	Northern Respondents: Some grammar school or less
Negroes have equal or better chance	12%	25%
Should be that way	9%	17%
Should not	2	6
Not ascertainable	1	2
White have best chance	84%	66%
Should be that way	19%	29%
Should not	63	32
Not ascertainable	2	5
Not ascertainable whether whites or Negroes have best chance	4%	9%

One of the hopeful evidences that prejudice toward Negroes will gradually decrease is the fact that young people are relatively more insistent that Negroes should have just as much chance as anyone else to get positions in defense plants.

In the South:

30 percent of the young (under 35 years) but only

22 percent of the elderly people (55 and over) thought Negroes should have equal opportunities with white people to get war jobs.

Again, in the North, this sentiment was held by:

65 percent of the young people, but by only

52 percent of the elderly people.

The differences, however, are slight, and it is possible that this tendency represents youthful liberalism which may slip away as the individual grows older.

Employment of Aliens

While a majority of the public wants Negroes to have an equal chance at good jobs in war industries, people are not so favorably disposed toward the employment of aliens. Only a third approved the use of this group to fill positions, in war factories.

> Should all workers in war industries have to be citizens of this country, OR do you think it is all right to hire some people who are not citizens?
>
> Citizens only 66%
> Some not citizens 31
> Don't know 3

Note that the question is couched in terms of aliens in general rather than enemy aliens. Probably, however, many respondents were answering in terms of enemy aliens.

Persons of foreign parentage more frequently favor hiring foreigners.

	Believe some aliens should work in war industries
Both parents foreign-born, but not in Axis countries	49%
Both parents born in Axis countries . . .	44
One parent born in Axis country	40
Both parents native-born	26

Education is also a very important factor in attitudes on this issue.

For example:

> 50 percent of the college graduates, but
>
> 25 percent of those with grammar schooling only, favored employment of aliens in war industry.

There were almost no differences between the attitudes of those aware of an industrial manpower shortage and those who are not; those expecting a draft of manpower and those who do not; those satisfied with the progress of production and those who are not; union workers and non-union workers; and, persons in various occupations.

Since the strong feeling against employment of aliens may be working to keep non-citizen machinists and others with badly needed skills out of war plants, appropriate informational measures stressing their loyalty and potential value should be in order.

Employment of Women

The largest remaining reservoir of labor supply is the nation's women particularly the married women. As defense workers are called in steadily-increasing numbers to the colors, more and more of the women not now employed will have to give up their present activities for war jobs. Mr. McNutt declared on December 29, 1942 that 4,000,000 women would have to go to work within twelve months.

The participation of women in remunerative work, as reported in the interviews, gives a rough picture of the present place of women in the labor force. (Note that only a fourth of all women are employed.)

	Married Women			Unmarried Women			
	20-34 years	35-54 years	55 and over	20-34 years	35-54 years	55 and over	Total
Employed	5%	9%	2%	6%	3%	*	25%
Not employed . . .	25	34	14	1	1	*	75
Percent of total women . . .	30%	43%	16%	7%	4%	*	100%

* Less than one-half of one percent.

Among the single women, the picture is one of almost complete employment. But only one out of five of the married women have yet gone to work. Moreover, the wives constitute the overwhelming majority of the female population, so that they represent the most abundant reserve supply of workers.

Since our ability to keep the production machine running in high gear depends largely on enlistment of women workers, the public attitude toward this issue -- and especially the attitude of wives -- is of paramount interest. The public overwhelmingly (71%) recognizes the need for married women without children to work in war industry. They drew the line sharply, however, at the employment of mothers; only 14 per cent believed there is any need for this group right now.

The only people among those interviewed who disagreed significantly with the general population were a very small group of unmarried men workers in non-war jobs -- including some who had perhaps been unable to land work in war plants. They vetoed most frequently the idea that women are needed in war industries:

49 per cent of said that even wives without children were not needed in war industries, compared with

21 per cent of the total population voting this way.

It is interesting that these comparatively high denials of the necessity for women in war industry came from semi-skilled and unskilled workers, particularly those not now connected with the war effort. In contrast, managerial and professional people showed highest recognition of need for women. This evidence points up two possible problems which may be involved in the placement of women in war plants: (1) preventing friction where men begin working with women for the first time; and (2) appeasing the resentment of workers who are left out of war industries in lower-paying jobs. Both could be solved more easily if workers understood more fully the necessity of putting women to work. Here is how men in various occupational groups voted on the need for married women without children in war production jobs at this time:

How many?

Believe women without children are needed in war industries

Professional and managerial workers in war industries	78%
Professional and managerial workers in non-war industries	70
Clerical workers in war industries	72
Clerical workers in non-war industries	69
Skilled workers (almost all in war industries)	65
Semi-skilled and unskilled workers in war industries	67
Semi-skilled and unskilled workers in non-war industries	54
Farmers	60

One of the attitudes most closely related to the belief that women are needed in industry is awareness of manpower shortages. This fact sharpens the urgency of correcting the mistaken majority impression that no industrial scarcity of labor now exists. Typical differences among highly educated men showed, for example that:

How many?

65 per cent of those who think war plants can get all the workers they need, but

79 per cent of those who said war plants cannot, thought there was a need for wives without children in war work.

The ever-present educational factor also appeared in the opinions on this subject. Among men:

77 per cent of the college graduates, but

60 per cent of those with grammar schooling only thought married women without children are needed,

Similar tendencies were apparent in the opinions of women.

The newspapers have probably spurred the approval for hiring married women in war work by some campaigning of their own. Over a six-week period, covering the end of September and October, discrimination against women and Negroes was strongly censured in some of the papers. Editorials concentrated their fire especially on the barriers against women. Since the women represent such an important labor pool, their own attitudes are considered in the following section.

IV. WILLINGNESS OF WOMEN NOT NOW EMPLOYED TO TAKE WAR JOBS

The crucial factor in the recruitment of women into the labor force is of course not the attitude toward any abstract principle of hiring married women, but the individual woman's own willingness to do war work. To measure this willingness and also to find what anxieties would be uppermost in the minds of women about to go to work, the following questions were asked of all people, including women not now in the labor market:

> In which of these two ways, do you think you yourself can help most to win the war -- by continuing to do what you're doing now, or by doing something else?
>
> If the Government should take you out of the job you're in now, and put you to work in a war job, what inconveniences or trouble do you think it might cause you?

The first question does not specifically mention "war job," but it was asked immediately after the discussion of shortages and the need for women, aliens, and Negroes in war work. It can be interpreted generally as a measure of resistance to taking war work.

Among women who are not employed, there is a very sharp cleavage between mothers and women without children. While many mothers have undoubtedly been drawn into war industries, the devotion of most of them to their families completely overshadows any patriotic impulse to take war jobs.

Both among women under 35 and those from 35 to 54, a large minority of the women without children concede that they could contribute more effectively by doing something other than what they are doing now. But, overwhelmingly the mothers voted to continue at their present tasks.

	Women not now in the labor force					
	20-34 years		35-54 years			
	Unmarried or no children	With children	Unmarried or no children	With children	Over 55	Total
Contribute most by doing what doing now	53%	81%	57%	77%	86%	77%
Contribute most by doing something else	42	16	33	19	9	19
Don't know	5	3	10	4	5	4
Per cent of total women not now working	9%	26%	6%	39%	20%	100%

While those women without children more frequently suggested they could contribute more by doing something else, reasonably large minorities of the mothers under 55 years of age also recognized that they were needed elsewhere. In numbers these are an extremely important group, since mothers comprise a very large percentage of women not working. Thus, 19 per cent of the total women not in the labor force believe they could contribute most by doing something else, and a majority of these (11%) were mothers under 55.

Care of children is the problem stressed most by young mothers confronted with the possibility of taking a war job. A few (9%, 20-34 years; 16%, 35-54 years) young mothers not now working, say they would face no great difficulty in taking a job. Many more of the women without children, however, foresee no difficulties.

	Problems to be faced in taking a war job				
	20-34 years		35-54 years		
	Unmarried or no children	With children	Unmarried or no children	With children	Over 55
Providing care for children	1%	72%	-%	34%	3%
Other family considerations	29	14	50	40	23
Considerations of health	7	2	16	12	49
Miscellaneous considerations	29	12	24	22	13
Would face no difficulties	40	9	20	16	15
Don't know	3	2	5	1	5
Per cent of total women not now working	9%	26%	6%	39%	20%

All this suggests that an important and fundamental principle of the military draft should be held constantly in mind by those striving to recruit women into the labor force. In general, women with no family responsibilities will be most willing to go, then those without children, and finally mothers. If mothers are to be used extensively, it is vital that excellent facilities be provided for children -- schools and nurseries which will match the care these youngsters receive at home. And such facilities would probably do much to speed the flow of women into war industries.

What War Jobs Women Believe They Can Do

In gearing woman-power to war jobs, another vital consideration is age. The younger the woman, the more likely she is to visualize herself either at a

factory machine or white-collar job. Older women tend more to believe they can make the greatest contribution performing domestic tasks, including the all-important duty of nursing.

The following table shows the striking differences between younger and older women in response to the question: "Suppose you had to take some kind of war job. What kinds of work do you think you could do best?"

	Women not now at work		
	20-34 years	35-54 years	55 and over
White-collar jobs, including managerial, professional and clerical . . .	39%	31%	12%
Skilled manual labor	5	3	-
Semi-skilled and unskilled manual labor . . .	31	20	8
Domestic tasks	19	32	39
Other jobs	4	5	4
Don't know what I could do, but could be trained	8	6	1
Health or age would forbid; could do nothing	4	7	37
Per cent of total women not now at work . . .	35%	46%	19%

A well-planned recruiting program might therefore give older women a great sense of community satisfaction and belonging by using their home-making talents to provide play centers and to relieve younger women of household duties.

Many of the large group mentioning skilled and semi-skilled occupations are people who have no training, but are willing to do any kind of factory work demanded of them.

Here are typical answers given by some women in this category:

"I could do any kind of factory work."

"I could do any factory work that didn't take any particular skill."

"I never worked in factories, but I could learn."

These comments provide evidence that large numbers of women are ready to step up and get their hands dirty on a production line, if this is necessary.

Among the women interviewed there is a relationship between the kind of a job which the respondent feels she can do and her feeling that she can contribute best to the war effort by changing from what she is now doing to something else.

	Work respondent thinks she could best do				
	Domestic duties	White-collar	Skilled	Semi-Unskilled	Don't know but willing to be trained
Contribute most by doing what now doing	85%	70%	65%		65%
Contribute most by doing something else	11	25	34		33
Don't know	4	5	1		2

Those who see themselves as suited primarily for domestic tasks are least willing to consider the desirability of changing their present pursuits, while those who think of themselves as suited for industrial work, or who express willingness to be trained for it, most frequently state that they could contribute more by taking up such duties. Those prepared to assume white-collar jobs fall between these groups in their estimate of the desirability of taking up such places in the war effort.

V. WILLINGNESS OF PEOPLE IN NON-ESSENTIAL JOBS TO TRANSFER TO ESSENTIAL JOBS.

Equally as vital as the recruiting of women into the labor force is the transfer of workers from non-essential to essential occupations. As in the case of unemployed women, the cooperation of some groups can probably be enlisted with a minimum of persuasion, while others will undoubtedly require much coaxing, and government concessions or aid to help them over the difficulties which they see ahead.

Those people who consider themselves already connected with the war effort -- both men and women -- seem extremely well satisfied with their present contribution and would probably like to continue at their jobs for the duration. About nine out of ten who considered themselves directly connected with the war effort, and three out of four who considered themselves indirectly connected said they could contribute most by staying in their present jobs.

Employed People not Connected with the War Effort*

	Men		Women		Total
	Self-employed	Working for someone	Self-employed	Working for someone	
Contribute most by doing what doing now	51%	39%	72%	48%	46%
Contribute most by doing something else	40	54	24	44	46
Don't know	9	7	4	8	8

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*Technical note: The respondents' rating of their work as directly, indirectly, or not connected of course involves prestige. A check on these ratings shows that about 70 per cent asserting they are directly or indirectly involved in our war effort actually are connected, and the remainder are not. While the labels people apply to themselves are not precise, they do suffice to set off roughly the groups in which war workers are concentrated.

Classing themselves as directly or indirectly connected are virtually all of the farmer and skilled-labor groups, about two-thirds of the white-collar people and semi-skilled laborers, and half of the unskilled group.

It is clear from this evidence that the social force of war is exerting tremendous pressure on those who get from their present occupation no sense of "belonging." This pressure can be of utmost value in converting people to war work.

Naturally, greater resistance to a change in jobs comes from the "self-employed" -- people who have in many cases invested years of labor and savings in their businesses. Thus, among those indirectly connected with the war effort, and particularly among those believing they are not at all connected, the resistance is much greater to changing present occupations among self-employed people than among those employed by someone else. Furthermore, the self-employed again and again cite the loss of business as a hardship.

Problems to be Faced in Taking War Job

	Men		Women	
	Self-employed	Working for someone else	Self-employed	Working for someone else
Family considerations.	16%	26%	17%	30%
Loss of business or job.	42	7	33	6
Transportation and household difficulties.	8	24	4	14
Considerations of health	4	7	18	10
Other.	7	7	4	3
Would face no difficulties	31	44	20	46
Don't know . . .	3	4	9	2

Other important factors related to the worker's willingness to change jobs are:

Length of service
Dissatisfaction with pay
Occupation -- particularly the degree of skill involved.

Many steps have already been taken to urge freezing seniority privileges of older workers and thus speed the transfer of this group into war jobs. The value of these moves is illuminated by the fact that among men workers not connected with the war effort:

49 per cent of those with more than three years of service in their present companies, but

31 per cent with three years or less showed resistance to changing jobs.

Also among the same group of workers:

51 per cent satisfied with their present pay, but

36 per cent not satisfied showed resistance to changing jobs.

Among the various occupational groups, the professional workers, managerial people, and skilled workers are most reluctant to change jobs. These groups perhaps include many respondents who have built up skills through years of education and practical experience, and who therefore cling more tenaciously to their present pursuits. The following table includes men and women not directly employed in war work. Note that despite high skills, large groups in all occupations recognize that they are needed elsewhere.

	Can contribute most by:	
	continuing what doing now	by doing something else
Professional and Managerial, self employed.	60%	35%
Professional and Managerial, employed by someone else .	67	30
Clerical.	49	47
Skilled Labor	61	34
Semi and unskilled labor. .	47	44

Men Not Now Employed

In the very small group of men not now employed, age and health are of course paramount considerations affecting willingness to take war jobs. Most of those under 55 recognized the importance of taking a war job, and almost half anticipated no trouble or inconvenience if they did so. There was less willingness among older men to make a change, and the majority cited ill health as the main difficulty.

	Men Not Now Employed	
	Under 55	Over 55
Continue what doing now.	35%	46%
Do something else	59	33
Don't know.	6	21

Problems to be Faced in Taking a War Job

	Men not now employed: Under 55	Over 55
Family considerations	13%	4%
Loss of business or job	6	0
Transportation and household difficulties.	13	6
Consideration of health.	12	53
Others.	15	3
Would face no difficulties. . . .	42	32
Don't know.	1	2

What Jobs People Think They Can Do

When asked what war jobs they thought they could do best, employed people quite naturally wanted to fit themselves into occupations closely related to what they are now doing. Yet present shortages are often rigidly stratified into demands for very specialized skills not possessed by people outside of war production, and this situation points up the need for expanded training facilities if large numbers of people are to be moved from non-essential occupations into war industries.

Respondent's Present Occupation

	Upper white collar, non-war industry	Lower white collar, non-war industry	Skilled (mostly in war industry)	Semi and unskilled non-war industry	Farm
War Job Respondent thinks he could do best:					
Professional or Managerial	33%	12%	2%	1%	3%
Lower white-collar	20	44	2	5	4
Skilled labor	18	11	47	14	20
Semi or unskilled labor	15	22	15	42	29
Farm	3	1	2	3	27

(Miscellaneous and other categories are not shown)

An unusually large number of people specified tasks closely related to their present occupation when asked what war job they could do best. It is also interesting that a smattering of people in virtually all occupations outside of the skilled laborer group stated that they could best do skilled manual work. While many of these people may be mentioning tasks that they would like to do instead of what they can do, it is possible that a considerable number of skilled workers might be combed out of other occupational groups.

WMC can expect employed people to demand the greatest possible use of their present skills. This is particularly true of the managerial, professional and skilled manual workers. If that is impossible, many people will undoubtedly feel bewildered when faced with the possibility of starting from scratch in a new trade. A well-planned system of training schools would obviously do a great deal to stiffen the morale of these people during a transition period, and would also facilitate greatly the smooth flow of green labor into a production machine running at top speed.

Voluntary Migration Into War Industry.

It is clear that large numbers of women not at work and of men in non-essential industry are well adjusted to the prospect of taking war jobs. And there are undoubtedly methods, such as stronger appeals and simple, efficient machinery for speeding transfer to jobs in munitions factories, which would move many of these people to act voluntarily. It is probable that such steps, if well coordinated, might obviate for a time compulsory shifting of workers.

But evidence gathered on the present survey indicates that up to November such voluntary measures as had been taken had met with relatively little success. Although many people not directly connected with the war effort recognized that they could contribute more effectively by changing jobs, only 15 per cent of those not already employed in war industries, and 7 per cent of the unemployed had actually applied for defense jobs.

It is highly probable that some of the people who wanted to get positions in factories making war material simply did not know how to go about obtaining them. Thus, a majority of respondents interviewed were not familiar with the USES as the agency through which to seek war employment.

When asked whether they knew of any government agency to which a person looking for employment in war industry could go for advice and help, the public responded as follows:

19 per cent mentioned the USES

18 per cent mentioned state employment services, the Civil Service, or made other answers suggesting that they had correct information.

11 per cent gave incorrect answers.

55 per cent did not know of any agency.

(More than one answer was made by some people.)

People not now employed and those in non-war jobs were if anything slightly less informed regarding the function of USES than other people, although differences were slight. A simple inquiry could, of course, obtain for any interested person correct information about where to go. It is notable in this connection that

54 per cent who <u>had applied</u> for a war job, but

29 per cent who <u>had not applied</u> realized that USES was the agency from which to seek help.

But this unfamiliarity with USES, plus the majority belief that no shortage of industrial manpower exists, and the additional fact that few people have applied for war work, underscores the informational and promotional job still to be done.

No voluntary campaign could have reasonable hope of success until the public as a whole is better informed regarding:

1. The need for them to shift to war work, and

2. The agencies set up to assist such shifts.

Since the USES seems destined to play a central role in manpower mobilization, it would, of course, be extremely valuable to know the public's appraisal of this organization. Information on this point was not sought in this survey, but some evidence is available which gives clues regarding the public's general attitude toward this organization.

From the testimony just presented, it is clear that a very large majority do not associate this agency with the draft of manpower. Probably a large number of these people do not even know of the existence of the organization.

There is also evidence from a special study made in St. Paul last March that white-collar personnel - that is, employers and clerical workers - tended to favor private employment agencies over public as a source of jobs.* On the other hand, unemployed people, relief clients, and two groups of semi-skilled workers -- firemen and street-car operators -- tended to favor public agencies over private ones.

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*Study conducted by the Employment Stabilization Research Institute of the University of Minnesota of which Dr. Dale Yoder and Dr. Donald G. Paterson are co-directors.

The question used and the results obtained in the St. Paul survey are as follows:

> "In your opinion, which offers the better opportunity of getting work, the private employment agency, or the public employment office?"

	Public	Private	Don't know
Clerical workers.	20%	47%	33%
Employers.	30	39	31
Street-car operators.	37	24	39
Firemen.	43	21	36
Social workers.	56	33	11
Relief clients.	47	19	34
Unemployed.	59	11	30

While these results are based on a special sample in only one locality, they suggest the existence of very important basic prejudices against public employment offices, especially among white-collar and managerial people. Such prejudice may have to be combatted in building up the efficiency and prestige of USES.

VI. SENTIMENT FOR COMPULSION

Although methods employed thus far to draw workers into war industries have involved little if any compulsion, the labor draft will persist as an ever-present possibility until the war is ended. And expectation of compulsion may do much to condition public response to a volunteer program. It is vital, therefore, to follow closely attitudes toward compulsion, and to chart the public's confidence in the agency which must exercise it.

The controversy over compulsion, along with criticism of USES and other manpower machinery came to a head in October. Much talk of drafting labor through a National Service Act was then in the air. It was climaxed by Mr. McNutt's statement on October 21 that he would send a legislative program to the White House within two weeks.

Attitude of Congressional Groups toward WMC

But this talk gave the signal for a flood of reports attacking the organization — or rather the lack of it — in various agencies dealing with manpower. The Tolan Committee stated: "The current demand for immediate passage of a national service act is a symptom of prevailing administrative shortcomings." This committee, the Truman Committee, and the WMC Labor-Management Policy Committee all demanded more centralized authority over manpower, stronger leadership from Governmental officials, and more productive use of present labor supplies. Until measures to bring about these recommended changes had been adopted and voluntary expedients had been completely exhausted, all three groups opposed compulsion and the two Congressional Committees laid at the door of WMC at least some blame for the "manpower muddle".

Newspaper Attitudes toward the Manpower Problem and WMC

During the same October period, the press also aimed an increasing amount of censure at the WMC. Its main criticisms were:

(1) The WMC has failed to forestall or alleviate labor shortages.

(2) The WMC has not eliminated discrimination against such people as Negroes, women and aliens in war plants.

(3) Unsure hands had produced confusion over objectives and policies for mobilization of civilian manpower.

Editors frequently took the Commission to task for the confusion in the manpower situation and demanded a clarification of general policy. The lack of any coherent pattern in their comments reflected editorial bafflement at the picture confronting them. Even in efforts to single out specific targets, their criticisms were diverse and often vague in tone. Thus, the administration in general was the most frequent target. When criticisms were specific, they were most often aimed at Mr. McNutt and the WMC, and less often at Congress and the President. Radio comment was almost uniformly vague, blaming "the administration" for manpower troubles.

The President's order reorganizing and strengthening WMC has undoubtedly met much of the dissatisfaction with management of the manpower problem. But the lukewarm press which greeted Mr. McNutt's appointment as head of the revitalized agency suggests that many editors are marking time until they can judge how well the new authority is used and how effectively our manpower problems are solved.

Newspaper Attitudes Toward Compulsion

It is interesting that during the last week in September and all of October, when talk of compulsion was at its height, the newspapers which discussed solutions of the manpower problem did not oppose compulsion. This is in sharp contrast to the stand taken by the Truman, Tolan, and WMC Labor-Management Policy Committees.

Compulsory service drew the attention of most editors who did examine a solution to manpower problems, and a large majority viewed it favorably.* A smaller number of newspaper writers pointed out the advantages in amalgamating Selective Service with WMC. Least popular was the view that split control was workable. It was seldom mentioned, and frequently opposed when it was mentioned.

Magazine comment was similar to that in newspapers, except that the idea of unified administration received relatively more attention and unanimous approval.

Public Attitudes toward Use of Compulsion in Shifting Workers To War Industry

Perhaps in response to frequent official forecasts that compulsion is just around the corner, the public in late October also registered approval of draft measures to fill war jobs.

Furthermore, the people supported the compulsory recruitment of farm workers more strongly than they supported the recruitment of industrial workers. The questions used and the results obtained for the national sample are shown below. Note that the first question measures opinion toward compulsory transfer of workers from non-essential to essential jobs. The issue of drafting people not now employed is not covered.

- -

* Only about 20 per cent of the newspaper comment on manpower discussed solutions, but a much larger proportion of editorials was critical of the manpower situation as a whole.

Question: "Right now, do you think the Government should take some of the people out of jobs not connected with the war effort and put them to work in war industries?"

Yes	61%
No	16
Depends	14
Don't know	9

"Next spring or summer, do you think the Government will probably have to take some of the people not already connected with the war effort and put them to work on farms?"

Yes	83%
No	7
Don't know	10

We have already reported that some groups of people recognize that they can contribute more to the war effort by changing over from their present occupations or activities, whereas others do not. But on the issue of compulsion, self-employed and hired people, those in war industries and those who are not, mothers and women without children all approve compulsory transfer of workers to war jobs by about the same majority. Almost the only significant exception appears in the vote of a group of men who might be greatly affected by a mobilization program -- that is, people working in industries not connected with the war effort. This group is considerably stronger in its approval of compulsion (72%) than the public as a whole (61%).

The Gallup poll has tested public sentiment for government control over manpower on several different occasions, and has used various question phrasings to measure approval. On all of those polls a majority ranging from slightly more than half to two thirds have favored giving the Government power to use compulsion in mobilizing American men and women. The following pair of questions, asked three times since last February, indicate that there has been very little change in the public's fundamental belief that the Government should have power to mobilize the civilian population:

Should all men and women over 18 who are not already in military service be required to register with the Government for some kind of civilian defense or war work?

Unless no: After finding out what each person can do, should the Government have the power to tell each citizen what to do as his part in the war effort and require him or her to do it?

	February	March	October
Oppose registration	13%	14%	20%
Oppose giving Government power to mobilize men and women	28	29	19
Favor giving Government power to mobilize	52	51	54
Undecided whether Government should have power to mobilize . . .	7	6	7

These figures closely parallel an August Gallup poll in which the public approved the Government's power to mobilize men workers for war jobs. The question used and results on this poll were as follows:

> Do you think the government should have the power to tell men workers what kind of a job they should work at, and where they should work?
>
> Yes 57%
> No 38
> Don't know 5

In October actual anticipation of some kind of labor draft was quite high. The current Bureau of Intelligence poll showed that 72 per cent thought the Government would take such a step within the next six months. And expectation of a labor draft is closely related to approval. Only,

> 12% of those who anticipated compulsion in six months, but
>
> 40% of those who did not, voted <u>against</u> a labor draft

Awareness that war plants cannot get needed additional workers of course buttresses the sentiment for compulsion. This fact further heightens the urgency of explaining to the public why and how present manpower shortage has put the brakes on production in many factories.

> 56% of those who say war plants <u>can</u> get all the workers they need, but
>
> 70% of those who say war plants <u>cannot</u>, favor compulsion,

Again,

> 72% who say farmers can get all the workers they need, but
>
> 85% who say they cannot, think that the Government will have to put people into farm jobs next Spring and Summer.

There is a marked amount of practice-what-you-preach thinking in this approval of a labor draft. For example, among those not connected with the war industries:

> 59% of those who favor compulsory transfer of workers to war jobs, but only
>
> 27% of those who do not or who are undecided, say that they could contribute most to the war effort by changing present occupations.

It seems clear from all this evidence that the idea of compulsion has won at least tentative acceptance in all levels of the population. The task of winning over those who do not now favor it will, however, probably be increasingly difficult. This group is composed largely of those who think there is no shortage in war plants, who show relatively high resistance personally to leaving their present occupations or pursuits, and who do not expect compulsory measures within six months.

But the basic American attitude that civilians as well as soldiers should in time of war be subject to Government call seems quite strong. It will do much to stimulate public obedience to a well-administered labor draft, if this measure becomes necessary.

Public Attitudes Toward Freezing

The public also tends to look with favor on rigid controls over labor migration from job to job. Two-thirds of the people registered approval of a plan under which war workers would be required to get Government permission before changing jobs, and only 25% were opposed. Presumably, those who had relatives taken by the Army might vote more strongly for stern controls over labor, but this is not the case. There were no differences on this issue between those having relatives in the armed forces and those who do not.

Those affected most directly -- the manual workers, and especially union workers -- were somewhat more opposed than others, but even a majority of these groups favored the plan.

	Percent favoring the plan
Professional and Managerial	73%
Clerical	73
Union manual workers	55
Non-union manual workers	64
Farmers	69

Recent intensive study of attitudes toward job-freezing among workers in five shipyards gives important insight into the labor view of this measure.

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Recent intensive study of attitudes toward job-freezing among workers in five shipyards gives important insight into the labor view of this measure.

> Satisfaction with the plant, its working conditions, and with local living arrangements seems to be the key to the worker's acceptance of job freezing.

Thus, sentiment for job-freezing is only lukewarm among workers dissatisfied with working conditions, but is relatively strong among those who are satisfied. Furthermore, the main objection of those opposing such a measure is that men would be forced to accept bad conditions. Finally, many who qualified their answer said: "OK, if community and job conditions are satisfactory."

Here are some comments from workers asked for their opinion on job-freezing, they indicate the strength of feeling on this subject.

> "To me, I don't know. It wouldn't be bad if a man could quit, if he has a good excuse for quitting, like being mistreated or not being given the job he can do. If he has a good reason, he should be excused and allowed to go elsewhere. They just mistreat them, and treat them as if they crawl on fours. If they did that to me, they'd have to take me in the army. I heard that at one of the plants, the boss there is making it pretty hard for men in the draft age. Do what he says or else. Men like that shouldn't be boss. He feels that he is a big-shot.

> "It's very good, if conditions are standardized throughout the whole industry. Naturally a man wants to go where there are better plants, better working conditions, and better housing. But obviously those things aren't standardized in the shipyard industry. When they do attempt to freeze labor, I hope that they will realize that they're putting a lot of power in managements hands, particularly where there's a weak union."

> "I don't like that idea." (Why?) "I am in the wrong place. I don't want to be froze in Mobile."

Other reasons for opposition were that the measure violated personal rights and also that it was unworkable and inefficient.

Most who favored the proposal viewed it as a war measure which would stop "drifting" and increase production.

> Apparently, if the worker's right to register disapproval of working or living conditions by quitting is removed, some satisfactory substitute must be provided. Unless this is done, job-freezing will surely bring much hardship and headache for those striving to increase production and keep up labor morale.

What People Demand in Administration of a Labor Draft

Although a majority of the public approved use of compulsory measures to fill war jobs, there are also many "ifs" and "buts" conditioning this approval. Some of these qualifications were brought to light during October in letters from Bureau of Intelligence observers throughout the nation. The observers

were in a position to report accurately the sentiments of labor editors and social workers; and also of a few businessmen and clergymen. While some of the conditions cited would be indispensable particularly to labor, others are typical of the provisos which might be laid down by the general public. Among the reassurances which will doubtless be required by the entire public as well as labor are the following. Note that the first and fourth conditions might apply to <u>any</u> manpower program, voluntary or compulsory.

1). They must be convinced that the compulsion will be administered firmly, fairly and efficiently.

2). The head of the agency must be a top-notch official and administrator who can command the trust of the individual.

3). They must feel confident that the compulsion is temporary.

4). They want the pertinent facts and regulations clearly and convincingly explained.

Here are some of the considerations mentioned by observers which are perhaps of special interest to the workers:

1). They believe any program involving compulsion must be endorced by A.F.of L., and CIO.

2). They insist that rights of workers must be protected. For example, they want to know what will happen to seniority rights, who will regulate working conditions, and how well the standard of living will be maintained.

3). They also demand that sacrifices be shared equally not only by workers but also by profit-making corporations and persons with incomes over $25,000.

4). They want labor to be a full partner in the enterprise through adequate representation on the administering agency.

These observers point out that the prospect of compulsion aggravates existing schisms between labor and management, and also between labor and farmers. The Government will be smack in the middle of this situation. Thus, while workers are demanding equal representation on the administrative agency, many belligerent white-collar people are probably vowing never to join a union if they are drafted into a factory having a closed shop. Past surveys have shown repeatedly that managerial and professional workers, and even clerical and lower white-collar employees are among the groups most hostile to unions; yet, many of the new workers must come from the ranks of these groups. On a Gallup poll conducted last August 78 per cent of the people said that no person drafted into a war industry should be required to join a union as a condition of work. The possibilities of friction in this situation are very great, and it is apparent that the administration of any manpower program will require the maximum of wisdom and tact.



Cutbacks in war orders following Germany's collapse are everybody's business. Lay-offs, slashed hours and earnings, closed plants, confusion—these will be felt by all of us, directly or indirectly.

If you've been hit, it isn't just YOUR headache. Nor will any private island of safety see you through the flood. We've all got to help build dikes to guard the whole community against common loss and suffering.

WHAT YOU CAN DO THROUGH YOUR UNION

Its success depends on the help you and other members give it!

To keep the plant in fullest possible use, press your employer to aim high in his plans and to speed reconversion as war needs end. Consult your International Union or the CIO Reconversion Committee on ways of preventing company stalling and of spurring sound government action to bring jobs for all.

See that lay-offs and rehirings are fair, according to seniority terms of the union agreement. Don't let the employer play off one group of workers against another. Union strength rests on unity of all members—veterans and war workers, old and young, whites and Negroes, men and women.

Use your union machinery to settle grievances speedily. Full cooperation with your International Officers is the most effective way of maintaining union conditions. While labor's no-strike pledge lasts, use government machinery for settling difficult disputes—the War Labor Board and the National Labor Relations Board.

CONGRESS OF INDUSTRIAL ORGANIZATIONS
718 JACKSON PLACE, N. W.
WASHINGTON 6, D. C.

ALABAMA EDITION

1,000 for $9
5,000 for $35

OCTOBER, 1944



On every Election Day support candidates who understand your problems and are friendly to unions. The people through their town, state and national governments can plan now for needed schools, houses and airports, for sensible taxes, and for other ways of promoting the general welfare.

After Election Day urge elected officials to act speedily and well. When CIO members are laid off, the whole community suffers. Many storekeepers, professional men, farmers, and other people are willing to join with CIO unions in common efforts to speed reconversion and plan public works.

For a job and unemployment benefits, go to the nearest public employment office.

GETTING UNEMPLOYMENT BENEFITS

Go to the public employment office as soon as you lose your job. Be sure to register for work and file a claim promptly even if you are in doubt whether you are eligible for benefits. If you delay, you may lose benefits.

If you are given only part-time work, ask your state Unemployment Compensation Agency if you can draw partial unemployment benefits.

State unemployment compensation laws are far from adequate although a lot better than they would have been without CIO effort. By knowing your rights, you can at least obtain what you are legally entitled to.

You are entitled to benefits if you have recently worked long enough in covered employment and are now out of a job and able and willing to work.

"Covered employment" includes most work in factories or other industries. But unfortunately government employees aren't entitled to benefits, nor are agricultural and domestic workers and certain other groups.

You are not entitled to benefits if you are not looking for work, if you do not register each week, if you are sick, if you left your job voluntarily under certain conditions, or if you turn down a "suitable" job.

If you quit your job because you expect to be laid off soon anyhow, you may lose your benefits. Find out before you quit.

If you are offered a job you feel you cannot accept, the way you answer may needlessly lose your benefit checks. In order to make clear that you are willing to work, don't refuse to go for a job interview without excellent cause. It is usually wise to get the facts so you will know whether you have a good reason for refusal that won't cause loss of benefits.

The Federal Social Security Act declares that you can turn down a job and still get benefits: (A) if the position offered is vacant due directly to a strike, lockout, or other labor dispute; (B) if the wages, hours, or other conditions of the work offered are substantially less favorable to the individual than those prevailing for similar work in the locality; (C) if as a condition of being employed the individual would be required to join a company union or to resign from or refrain from joining any bona fide labor organization.

If you are a veteran, you get special benefits: $20 a week for up to 52 weeks. Veterans should read the CIO War Relief Handbook, "Facts and Tips for Veterans."

If you move to another state, you can get benefits from the state in which you worked by applying at the Employment Office nearest your new home.

If you are 65 years old or more, you may want to start your claim for old age benefits so that they can begin when your unemployment benefits end.

YOUR RIGHTS AND WRONGS
UNDER THE ALABAMA UNEMPLOYMENT COMPENSATION LAW

All organized labor in America calls for a national unemployment compensation law. But Congress has not listened, and each worker will have to do the best he can under the inadequate state laws, until all workers combine to elect a Congress that will enact a satisfactory program.

In Alabama, the agency is the Department of Industrial Relations, headquarters in Montgomery, local offices in all towns and cities.

To Qualify: During the previous year, you must have worked in "covered" employment (for one or more employers) and have earned an amount equal to 30 times your weekly benefit payment. For example, if your weekly benefit amount is $15, your earnings would have to amount to at least $450. In addition, you must have worked less than 160 hours and earned less than $120 during the 3 weeks before your unemployment.

Waiting Period: One week. Benefit payments begin with the second week, but may not arrive promptly. File a claim the very day you are laid off, or the next morning.

Weekly Benefit Amount: The amount of the benefit check you receive is determined by your past earnings. It is about 1/26 of your highest earnings in a three-months' period, but not more than $15 or less than $2 a week.

Maximum Duration: 20 weeks (during a 52-week benefit year). Your maximum duration may be less, depending on your past earnings.

Partial Benefits: If you work less than full time, you can have partial benefits, which amount to the difference between your weekly benefit amount and your actual weekly earnings less $2. Example: Weekly benefit amount $15. Actual weekly earnings $10. Partial benefit payment $7.

"Disqualifications": Employers got a lot of tricky phrases in the state law to cut workers out of benefits they otherwise would receive. For quitting without good cause, your earnings under the job you left will not be credited in deciding your benefit rights. This would mean total loss of benefits during your present unemployment if you did not have earnings from other covered jobs during the previous year. If you are discharged for misconduct connected with your work, your waiting period may be increased by 3 to 6 weeks. In addition, the period during which you can receive benefits is cut by the same number of weeks, so that your maximum duration might be 17 or 14 weeks, instead of 20 weeks.

"Suitable Work": Another employers' tricky angle. Be careful on this. You will not receive any benefits during your present unemployment if you refuse to take a job the State Agency considers suitable. You will not be entitled to benefits until you have again earned wages equal to 20 times your weekly benefit amount.

Don't refuse to be interviewed for a job, even if you think it is one you will not accept. Instead, go and find out the facts. Know your rights, and if you find the job is unsuitable, be sure to explain your refusal in terms that will insofar as possible protect your benefit rights.

Whether or not a job offered is "suitable work" is decided on the merits of each case. The distance from the job, health, previous work history, and perhaps family circumstances are usually taken into account by state agencies in making rulings on whether a job offer was sufficiently suitable for an individual worker and whether refusal of a job means loss of benefits.

If you are refused benefits, you have the right to appeal but you must act within 7 days after the agency's statement of your benefit rights is delivered or mailed to you. Go to the local employment office and ask to have your case reviewed as the law provides. You may appeal not only refusal of benefits but other rulings on your benefit rights.



Which is the STRONGER?



A MESSAGE TO SIX MILLION CIO MEN AND WOMEN

We have proved our strength in fighting foreign enemies. We can be equally strong at home in the difficult months of change ahead.

The CIO was formed to meet the type of situation that cutbacks will bring. Our unions were born of the desire for decent levels of living, fair play, security and democracy. The vision, courage, and unity of millions of Americans like yourself have welded our mighty organizations.

In the great industries which have made victory for the United Nations possible, we have always gone forward despite opposition and lying attacks.

Our members can rightfully be proud of the contribution they have made to the welfare of their communities and the power of our nation during critical times. As victory abroad brings attention to problems of peace, CIO men and women will be equally alert and successful.

The laws we proposed that were defeated in Congress would have eased the change back to civilian production. Our program would have meant fewer people without jobs after Germany's collapse, better unemployment benefits, and planning for full production.

Now we must put new energy into our efforts. The life we shall lead in the years ahead depends upon our activities in our unions and in the political field. By our combined efforts we can build the kind of world for which we have been fighting.

STICK BY YOUR UNION

Labor Mkt

Serial No. R. 1681

[From the MONTHLY LABOR REVIEW (August 1944) of the Bureau of Labor Statistics, United States Department of Labor]

Sources of Wartime Labor Supply in the United States

Summary

SINCE the beginning of the National Defense Program in mid-1940, the number of persons employed in civilian jobs or in the armed forces has increased by more than 16 million. About 7 million of the wartime gain in civilian employment and military strength was accomplished through the employment of persons who were unemployed in 1940 and the remaining 9 million was made possible by increases in the size of the total labor force. On the basis of pre-war trends the labor force would have been expected to increase by only about 2½ million between 1940 and 1944. The gain of 6½ million above this expected or "normal" increase represents persons who, in ordinary times, would be students, housewives, retired workers, or others not working or seeking work in paid employment.

Youths of school and college age have been the largest single source of additional wartime labor supply, accounting for more than 3 million or approximately half of the extra workers in the labor force. Although many of these are working only part time while continuing to attend school, civilian attendance at schools and colleges is about 2,000,000 below the level expected on the basis of pre-war trends, and there is a serious educational deficit among persons now in their teens and early twenties.

A second major pool of wartime labor has been supplied by women over the age of 35 who have increased their labor-market participation by about 1½ million in excess of peacetime expectations. The extra workers in this group were recruited mainly from among married women who have no children or whose children are past the age where they require full-time care on the part of the mother. The number of workers among women between the ages of 20 and 35, on the other hand, has exceeded peacetime expectations by a relatively small margin. Not only has recruitment of young women been limited by their responsibility for the care of young children, but also many young women have dropped out of the labor market as the result of the dependency features of Selective Service regulations and wartime increases in marriage and birth rates. If it were not for an abnormally high proportion of workers among young women whose husbands are in the armed forces, the number of women between 20 and 35 in the wartime labor force would probably be somewhat below the level expected on the basis of pre-war trends.

Adult men have contributed approximately 1½ million extra workers to the wartime labor supply and these are about equally divided between men from the "fringes" of the labor market and men who, in normal times, would be retired. Those from the "fringes" of the market are men who ordinarily seek work only occasionally or intermittently and men of doubtful employability who had given up the search for a job after failing to measure up to the relatively rigid requirements of the pre-war labor market. The older men in the wartime labor market also include a considerable number who have continued working beyond the age when they ordinarily would have

[1] Prepared in the Bureau's Occupational Outlook Division by Leonard Eskin.

retired. Although pre-war trends toward earlier retirement would normally have led to a decline in the rate of labor-market participation among older men between 1940 and 1944, there was actually a considerable increase during this period.

Trends in the Labor Force Since 1940

In the spring of 1940, just prior to the beginning of the National Defense Program, there were close to 54 million persons in the American labor force, including 45½ million employed in civilian jobs, ½ million in the armed forces, and almost 8 million unemployed.[2] Outside the labor force, there were in the noninstitutional population 14 years of age and over approximately 46½ million persons (9½ million men and 37 million women), including 30 million homemakers, 9½ million students, 5 million persons unable to work, and 2 million in other nonworking categories. The changes in the labor force from the predefense period to the current period of full-scale war activity may be summarized conveniently by analysis of the four 12-month intervals beginning with April 1940 when the Decennial Census was taken [3] and the current Monthly Report on the Labor Force was initiated.[4]

APRIL 1940–APRIL 1941

The first period, from April 1940 to April 1941, was marked by the beginning and initial expansion of the National Defense Program and the passage of the Selective Service Act. Aggregate civilian employment and military strength rose by 2¾ million (table 1) as unemployment was reduced by 2 million and the labor force increased by three-fourths of a million. Although this increase in the size of the total labor force was approximately in line with normal expectations, there were significant deviations from the "normal" trend among both men and women (chart 1).

The number of men in the labor force increased by almost a million or about 600,000 in excess of normal expectations. Most of the abnormal increase occurred among young men under 25, indicating a tendency to leave school earlier as jobs became more plentiful. In addition, the gain of a million in the net strength of the armed forces during this period no doubt involved the recruitment of some young men who, otherwise, would have remained in school.

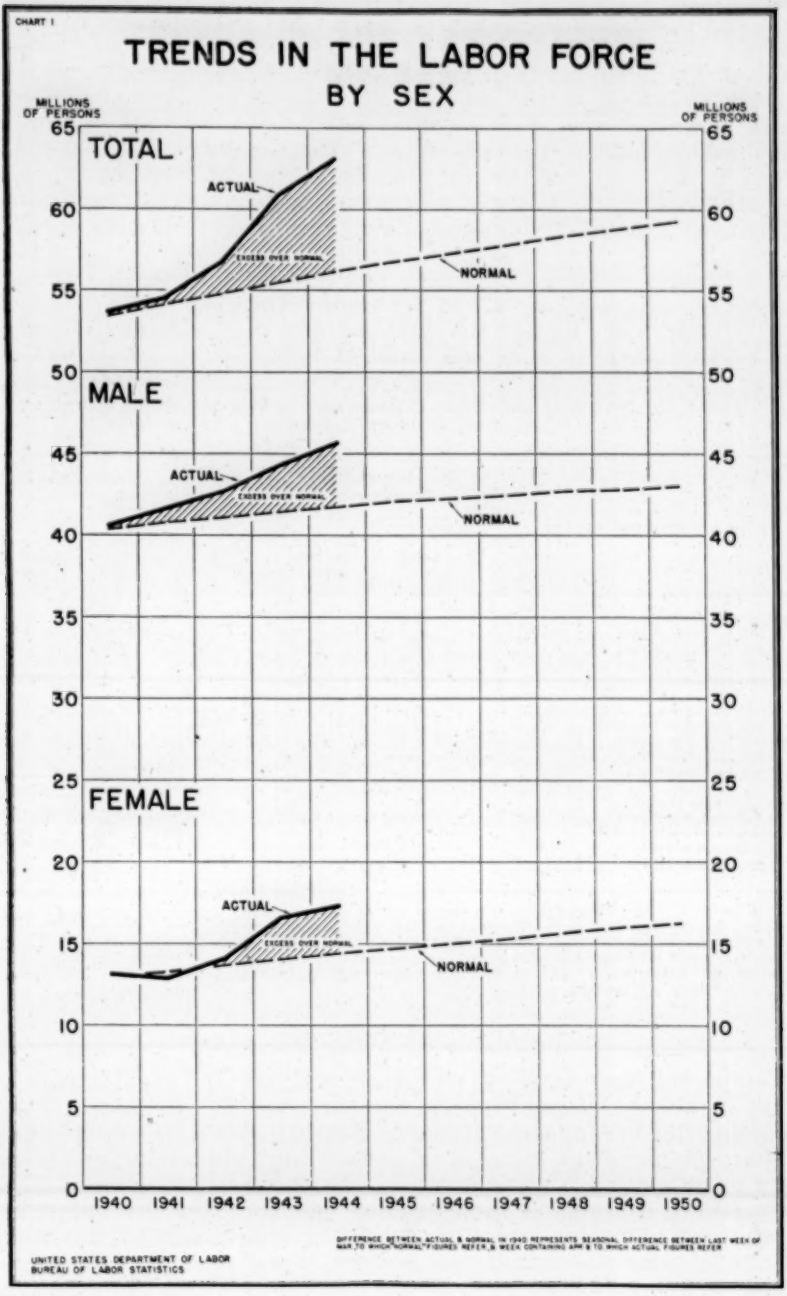
Among women there was actually a decline of 200,000 in labor-force participation between April 1940 and April 1941, whereas an increase of more than 300,000 would have been expected normally. A major reason for the withdrawal of women from the labor market during this period was the rise in marriage and birth rates accompanying improved economic conditions. In addition, gains in family income probably accounted for some withdrawals from the labor market among women who had sought or obtained jobs in order to increase the family income during the depression.

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[2] Unemployment in April 1940 was estimated at 7.8 million persons of whom approximately 2.9 million were on public emergency work (WPA, etc.) and 4.9 million were seeking work.

[3] The labor-force data in the Decennial Census actually referred to the last week in March 1940. Subsequent to that date, however, the Census Bureau's Monthly Report on the Labor Force referred to the week containing the 8th of each month rather than to the last week in the month. For purposes of comparability, therefore, the analysis will be based on the figures for April of 1940 and April of each subsequent year.

[4] The Monthly Report on the Labor Force, which is taken on a sample basis each month, was initiated by the Work Projects Administration and taken over in 1942 by the Bureau of the Census. Recent revisions in both the Decennial Census data and the Monthly Report data have made the two comparable as far as possible. (See Census Bureau releases P–44, No. 6, and MRLF No. 22.)


CHART 1
TRENDS IN THE LABOR FORCE
BY SEX
MILLIONS OF PERSONS
MILLIONS OF PERSONS
TOTAL
ACTUAL
EXCESS OVER NORMAL
NORMAL
MALE
ACTUAL
EXCESS OVER NORMAL
NORMAL
FEMALE
ACTUAL
EXCESS OVER NORMAL
NORMAL
65
60
55
50
45
40
35
30
25
20
15
10
5
0
1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950
DIFFERENCE BETWEEN ACTUAL & NORMAL IN 1940 REPRESENTS SEASONAL DIFFERENCE BETWEEN LAST WEEK OF MAR. TO WHICH "NORMAL" FIGURES REFER & WEEK CONTAINING APR. 8 TO WHICH ACTUAL FIGURES REFER
UNITED STATES DEPARTMENT OF LABOR
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Another factor contributing to the decline in the female labor force during the first year of the Defense Program was the introduction and passage of the Selective Service Act. The extent to which the act directly caused women to leave their jobs in order to be considered dependent on their husbands is, of course, a matter of conjecture. Insofar as the act operated to increase marriage and birth rates, however, it no doubt exerted an indirect influence in causing some women to leave the labor force. There is a striking relationship between the timing of the introduction and passage of the Selective Service Act and the timing of movements in marriage and birth rates. Marriages (seasonally adjusted annual rate) rose from 9.6 per 1,000 of population in May 1940 to 14.1 in June when the Selective Service bill was introduced in Congress. The rate dropped to 12.0 in July, but surged to a peak of 14.7 in September when the measure became law. Birth rates followed the same pattern, with a lag of 10 months, the peaks coming in April and July of 1941.[5]

TABLE 1.—*Sources of Increase in Civilian Employment and Armed Forces, April 1940–April 1944* [1]

Period and sex	Increase in civilian employment and armed forces (in thousands)			Sources of increase (in thousands)	
	Total	Civilian employment	Armed forces	Decrease in unemployment	Increase in the labor force
Total, 4-year period	16,170	[2] 5,580	10,590	7,030	[2] 9,140
April 1940–April 1941	2,750	1,770	980	1,990	760
April 1941–April 1942	5,390	3,830	1,560	3,070	2,320
April 1942–April 1943	5,910	480	5,430	1,790	4,120
April 1943–April 1944	2,120	[2]—500	2,620	180	[2] 1,940
Males, 4-year period	10,390	[2]—10	10,400	5,530	[2] 4,860
April 1940–April 1941	2,650	1,670	980	1,660	990
April 1941–April 1942	3,450	1,900	1,550	2,420	1,030
April 1942–April 1943	3,000	—2,350	5,350	1,370	1,630
April 1943–April 1944	1,290	[2]—1,230	2,520	80	[2] 1,210
Females, 4-year period	5,780	5,590	190	1,500	4,280
April 1940–April 1941	100	100	----------	330	—230
April 1941–April 1942	1,940	1,930	10	650	1,290
April 1942–April 1943	2,910	2,830	80	420	2,490
April 1943–April 1944	830	730	100	100	730

[1] Sources: (1) Civilian employment—Bureau of the Census, Monthly Report on the Labor Force; (2) Armed forces—Bureau of Labor Statistics and War Manpower Commission.

[2] Net change computed on the basis of April 1944 totals adjusted to exclude an estimated 200,000 persons on temporary jobs who were included in the Census enumeration for April 1944 because the Census week coincided with Easter week. Adjustments were made on the basis of interpolations between March and May and experience in previous years.

APRIL 1941–APRIL 1942

The period from April 1941 to April 1942 saw the rapid expansion of the National Defense Program and the transition to an actual war program after the Japanese attack on Pearl Harbor in December 1941. A sharp employment increase in defense and war activities—munitions manufacturing, transportation, the Federal Government—was accompanied by gains in the consumer goods and service industries, in which employment was stimulated to record peaks by the rising volume of consumer purchasing power. Total civilian employment

[5] American Journal of Sociology, November 1942: The Impact of the War on Population and Vital Phenomena, by Philip M. Hauser. Marriage rates quoted are based on 16 States for which monthly data are available.

rose by almost 4 million—the largest 12-month increase ever recorded in the United States—and at the same time some 1½ million men were added to the armed forces. Reductions in unemployment accounted for 3.1 million of the total gain of 5.4 million in civilian employment and military strength, while increases in the labor force contributed 2.3 million.

During 1941 the female labor force recouped the losses sustained in 1940 and the male labor force continued to increase at a rate somewhat in excess of "normal." At the time of the attack on Pearl Harbor the number of women in the labor force was approximately in line with normal expectations and the number of men was about a million over "normal." By April 1942 the female labor force exceeded the normal level by almost half a million and the number of extra workers in the male labor force had grown to 1½ million.

Among the women there were approximately 700,000 extra workers, divided equally between girls under 20 years of age and women over 35. This was partially offset, however, by a deficit in the 20–34 group which was still 200,000 below "normal," as a result of the withdrawals during 1940 and a continued upward movement in marriage and birth rates.

Approximately 600,000 of the 1.5 million extra males in the April 1942 labor force were under 20 years of age, 200,000 were between 20 and 25, and the remaining 700,000 were spread fairly evenly throughout the age range over 25.

APRIL 1942–APRIL 1943

The mobilization of manpower for the war effort proceeded at top speed during the interval from April 1942 to April 1943 and a large part of the total mobilization to date was concentrated within that period. Approximately 5½ million persons were added to the armed forces alone. Although the net increase in total civilian employment was only half a million, there was an extensive "reshuffling" of workers within the civilian economy. The munitions industries and Government war agencies experienced their most rapid expansion during this period—an expansion which was supplied largely through shifting of workers from employment in other fields, particularly construction, agriculture, trade, and service.

The unemployed had supplied 5 million of the 8 million increase in aggregate civilian employment and military strength during the 2 years ending April 1942. Thereafter, new recruits to the labor force became the main source of labor supply, accounting for more than 4 million out of the 6 million increase that occurred between April 1942 and April 1943. The remainder of the gain in civilian employment and military strength was supplied through a reduction of 1.8 million in unemployment, which fell to a near-minimum level of less than 1 million persons and most of these were in the process of changing jobs.

Even more unusual than the unprecedented mobilization of 5½ million men for the armed forces during the interval between April 1942 and April 1943 was the addition of 2½ million women to the labor force. The magnitude of an increase of this size in the course of a single year can perhaps be better understood when it is considered that it is approximately equal to the gain in the female labor force during the entire decade from 1930 to 1940.

The greatest contribution to the record-breaking increase in the female labor force was made by women over the age of 35. Labor-force participation in this group increased by 1.3 million, or about 1.1 million in excess of normal expectations. Teen-age girls accounted for more than half of the remaining gain in excess of "normal," but there was also a substantial increase in the 20–34 age group which rose to a level above "normal" for the first time since 1940. Altogether, the increase in female workers during this period exceeded normal expectations by about 2.1 million, bringing the total number of extra women workers in the labor market to 2.6 million in April 1943.

The male labor force also experienced its greatest gains during this period. An increase of 1.6 million—about 1.2 million over "normal"—brought the total number of extra male workers to 2.7 million. Three-fourths of the abnormal increment took place in the youngest and oldest age groups, the number of teen-age boys in the labor market increasing by 500,000 in excess of normal expectations and the number of men over 55 by 400,000.

APRIL 1943–APRIL 1944

By the autumn of 1943 the broad objectives for mobilization of manpower in civilian industries had virtually been attained. After reaching a peak in November, munitions employment started on the downgrade and, by April 1944, was slightly under the April 1943 level. This decline was made possible not only by decreases in requirements for certain munitions items, but also by increases in efficiency and labor utilization resulting from greater experience with production methods and labor-market controls. Total production of munitions was maintained at approximately peak levels even after employment turned downward.

As total manpower objectives were approached, the principal problem shifted from one of general nation-wide mobilization to one of meeting labor shortages in local centers of war production and in certain industries where wages or working conditions are unfavorable or where able-bodied men are required. Up to the end of 1942 the number of men in civilian jobs had been maintained well above the 1940 level, for the number of unemployed men and new male workers taking jobs had been more than enough to offset withdrawals to the armed forces. With the reserves of unemployed men just about depleted, however, the needs of the military ate into the ranks of male civilian workers throughout 1943 and the first part of 1944. In April 1944 the number of men in civilian jobs was approximately the same as in April 1940. Thus, the net increase of 5½ million in civilian employment since 1940 had been accounted for entirely by women. In addition, some 200,000 women had been added to the armed forces (table 1).

The only substantial demands for additional manpower between April 1943 and April 1944 came from the armed forces which expanded by 2.6 million. This expansion was made possible by an increase of 1.9 million in the labor force and decreases of 500,000 in civilian employment and 200,000 in unemployment. The major part of the gain in the labor force took place among men, who increased by 1.2 million or about 900,000 above normal expectations. Men under 45

years of age accounted for all of the abnormal increase, 600,000 of the gain being concentrated among boys under 20, particularly the 18- and 19-year-olds who had become liable for military service at the end of 1942. Teen-age boys entered the armed forces in large numbers between April 1943 and April 1944 as limitations were placed on draft deferments, first for nonfathers under the age of 26 and later for all persons under the age of 22. High-school enrollment of boys aged 18 and over which had declined by less than 50,000 between the school years of 1939–40 and 1942–43 dropped by 200,000 between 1942–43 and 1943–44.[6] Similarly, the number of civilian men enrolled in college declined by only 140,000 between the autumns of 1939 and 1942, and then fell by more than 400,000 in the following year.[7]

The increase in the female labor force between April 1943 and April 1944 exceeded normal expectations by 400,000 and virtually all of this abnormal gain was accounted for by women between 20 and 25 years of age. This reflected the drafting of married men on a large scale as the pool of physically fit men without dependents and with no occupational deferments was exhausted. By April 1944 there were about 3 million women in the United States with husbands absent in the armed forces.[8] Many young married women who would normally have quit work or remained outside the labor force found it necessary to continue working or to take jobs when their husbands entered military service.

Characteristics of Extra Workers in the Labor Force, April 1944 [9]

Altogether, the increase in the labor force during the 4 years ending in April 1944 exceeded normal expectations by 6.7 million. For purposes of convenience in describing their characteristics, the extra workers may be divided into the following groups:

		Number [1] *(in millions)*
All groups	Normally students, housewives, retired or others not working or seeking work in paid employment	6. 7
Boys and girls, 14–19	Mostly from school and college	2. 8
Young men, 20–24	Mostly from college	. 5
Young women, 20–24	Mostly service wives	. 4
Women, 35–64	Mostly married women with no young children	1. 5
Men, 25–54	Mostly from the "fringes" of the labor market	. 7
Men, 55 and over	Mostly persons who have postponed retirement	. 8

[1] These data are not comparable to similar data appearing in the August 1943 and February 1944 issues of the Monthly Labor Review. See prefatory note to table 2.

More detailed information classified by age and sex is given in chart 2 and tables 2 and 6.

[6] U. S. Office of Education Circular No. 227: Some Effects of the War on Public Schools, 1942–43 and 1943–44, by Emory M. Foster. Washington, 1944.

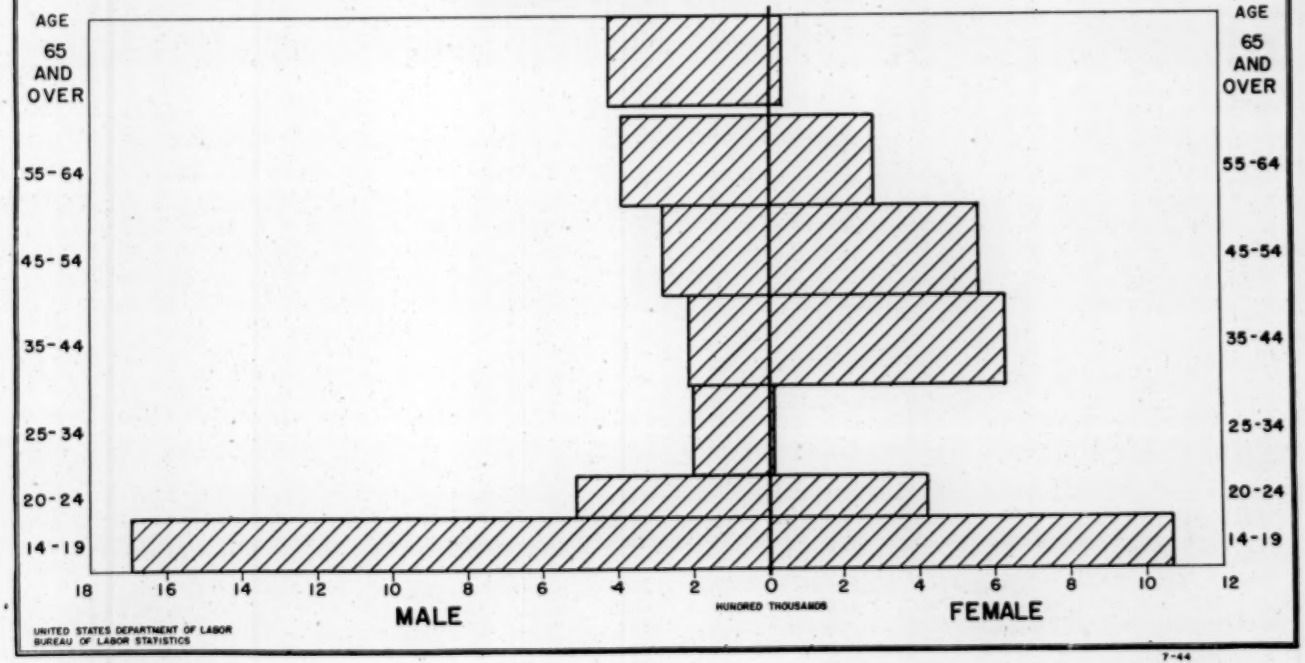
[7] U. S. Office of Education Circular No. 228: Effects of the War upon Colleges, 1943–44, by Henry G. Badger and Benjamin W. Frazier. Washington, 1944.

[8] A Census Bureau sample survey taken in February 1944 found 2,760,000 women in the United States with husbands absent in the armed forces. See Census release P–S, No. 1.

[9] This section will be confined to a description of the characteristics of the extra workers in the labor force. For a brief discussion of the extent to which these workers represent temporary or permanent additions to the labor force, see Factors Determining Post-War Job Transfers and Unemployment, in Monthly Labor Review, February 1944 (p. 272).

CHART 2

ESTIMATED EXCESS OF APRIL 1944 LABOR FORCE OVER "NORMAL"
CLASSIFIED BY AGE AND SEX



UNITED STATES DEPARTMENT OF LABOR
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7-44

TABLE 2.—*Estimated Excess of April 1944 Labor Force over "Normal," Classified by Age and Sex* [1]

[Data in this table are not comparable to similar data appearing in the August 1943 and February 1944 issues of the Monthly Labor Review because basic labor-force estimates have since been revised. See Monthly Labor Review, May 1944, pages 1118 and 1119]

Age group	Estimated excess (in thousands)		
	Both sexes	Males	Females
Total, 14 years and over [2]	6,700	3,700	3,000
14–19 years [2]	2,760	1,690	1,070
14–17 years	1,730	1,090	640
18–19 years	1,030	600	430
20–24 years	930	510	420
25–34 years	210	200	10
35–44 years	840	210	630
45–54 years	840	280	560
55–64 years	670	390	280
65 years and over	450	420	30

[1] Based on comparisons between (1) estimates of actual labor force compiled from data on civilian labor force from the Bureau of the Census Monthly Report on the Labor Force plus unofficial estimates of armed forces; and (2) estimates of "normal" labor force adapted from Census Bureau release P–44, No. 12. Actual labor-force estimates were adjusted to exclude an estimated 200,000 teen-age persons on temporary jobs who were included in the Census enumeration for April 1944 because the Census week coincided with Easter week. Adjustments were made on the basis of interpolations between March and May and experience in previous years.

[2] The excess in the teen-age group is somewhat overstated because the "normal" labor-force estimates refer to the last week in March, whereas the actual estimates refer to the first week in April. There is a slight seasonal rise between these two weeks.

SCHOOL AND COLLEGE AGE GROUPS

About 3.3 million, or approximately half, of the abnormal wartime increase in the labor force has been supplied from young persons who would normally be devoting full time to their schooling. Many of these youths, however, have not given up their schooling completely. Large numbers, especially among the 1.7 million under 18 years of age, are working part time while continuing to attend school. In Baltimore, Md., for example, one-third of the students in high school and junior high school have part-time jobs. Since Baltimore is an area of acute labor shortage, this proportion is probably higher than that prevailing in the country as a whole. Nevertheless it is an indication that substantial numbers of the boys and girls in the labor force are continuing to attend school. In addition, a great many young men in the armed forces have been able to continue their college or university training on an accelerated basis under special Army and Navy programs [10] and others have been given special college courses in technical subjects as part of their military training. Military enrollments in colleges, universities, and professional schools increased by more than 350,000 between the autumn of 1939 and the autumn of 1943. This was more than offset, however, by a decline of 600,000 (560,000 men and 40,000 women) or 44 percent in civilian enrollments.[11] At the same time public-school enrollment of boys and girls aged 15 years and over dropped by approximately 1,700,000 (900,000 boys and 800,000 girls) or 30 percent between the school years of 1939–40 and 1943–44.[11] About 250,000 of this drop in enrollment was caused by a decline in the teen-age population and the remaining 1,450,000 is the effect of premature withdrawals from school.

[10] These programs (Army Specialized Training Program, Army Air Forces Cadet Training Program, and the Navy V–5, V–7, and V–12 programs) were drastically curtailed, however, during the closing months of 1943 and the first half of 1944.

[11] See sources cited in footnotes 6 and 7.

Although many of the youths who took jobs in industry or entered the armed forces were not cut off completely from formal education, it can be seen that the drop in high-school and college enrollments occasioned by the war has been large enough to cause a serious educational deficit among persons now in their teens or early twenties. Many of those whose schooling was interrupted by the war have already reached the age at which they normally would have left school and many others will reach that age by the time the war is over. For this reason it is important to encourage the return to school of persons whose education has been interrupted, not only through measures for financial aid such as those included in the recently enacted "G. I. Bill of Rights," [12] but also through the adoption by schools and colleges of programs designed to meet the educational needs of an older and more mature group of students.

WOMEN UNDER 35 YEARS OF AGE [13]

The labor-market activity of women between the ages of 20 and 35 has been affected by a variety of offsetting factors. On the one hand, general gains in family income, increases in marriage and birth rates, and dependency features of Selective Service regulations have acted as a check on their participation. On the other hand, the drafting of millions of young married men has caused an abnormally high rate of participation among their wives. Approximately half of the women with husbands away in the armed forces are in the labor force as compared with less than one-fifth of the other married women. Part of this difference is caused by the relatively young age distribution of service wives; but even age for age, the proportion of workers among service wives is between two and three times the proportion among women with husbands present (table 3). This relationship holds true for women with young children as well as for those without young children (table 4).

The easy availability of jobs and the wartime pressure to recruit women workers have also brought a number of single young women into the labor market who normally would not seek employment. Increases from this source, however, have been limited by the fact that, even in normal times, there are relatively few single young women who do not work or seek work when their health and household responsibilities will permit them to do so.

Among women between 20 and 25 years of age the participation of service wives in the labor force and the wartime pressures to enter the labor market, if household responsibilities permit, have overbalanced the effect of increased marriage and birth rates, so that the number of workers in this group exceeds normal expectations by about 400,000. In the 25–34 group, however, the various factors have approximately offset each other, so that in April 1944 there was no significant deviation from the "normal."

If it were not for an abnormally high proportion of workers among the service wives, the number of women aged 20–34 in the wartime labor market would probably be somewhat below the "normal" based on pre-war trends. Since 1940 there has been a marked increase in

[12] Public Law 346, 78th Congress, 2d Session, approved June 22, 1944.

[13] This section is based largely on an unpublished memorandum by Lester M. Pearlman of the Bureau of Labor Statistics.

the proportion of young women who are married, and, in view of the rise in birth rates,[14] this has no doubt been accompanied by a similar increase in the proportion with young children. Table 5 shows comparative figures on marital status of young women in April 1940 and February 1944.

TABLE 3.—*Women in the Civilian Labor Force, by Marital Status and Age, March 1940 and February 1944* [1]

Age group	All women [2]		Single		Married [3]			
						1944 [4]		
	1940	1944 [4]	1940	1944 [4]	1940 total	Total	Husband present	Husband absent in armed forces
	Number (in thousands)							
Total, 14 years and over	13,008	16,630	6,377	6,940	3,919	6,790	5,410	1,380
14–19 years	1,396	2,130	1,307	1,930	61	190	([5])	([5])
20–24 years	2,698	3,130	2,052	2,110	492	900	400	500
25–34 years	3,593	3,800	1,615	1,380	1,428	2,020	1,410	610
35–44 years	2,488	3,600	694	830	1,075	2,010	1,880	130
45 years and over	2,833	3,910	709	690	863	1,670	1,650	([5])
	Labor-force-participation rates (percent) [6]							
Total, 14 years and over	25.8	31.8	45.5	54.9	13.8	21.6	18.9	50.0
14–19 years	18.9	30.6	19.7	31.3	9.3	25.7	([5])	([5])
20–24 years	45.6	52.3	73.1	86.1	17.3	27.1	17.3	49.0
25–34 years	33.3	35.4	78.9	84.1	18.1	23.6	19.0	54.0
35–44 years	27.2	36.5	73.4	80.6	15.3	25.9	25.1	56.5
45 years and over	16.4	21.0	45.7	50.7	8.6	15.1	15.0	([5])

[1] Source: (1) March 1940—16th Population Census, 1940, The Labor Force (Sample Statistics), Employment and Personal Characteristics; (2) February 1944—Bureau of the Census, Monthly Report on the Labor Force.

[2] Includes approximately 2.7 million women in 1940 and 2.9 million in 1944 in marital status categories (widowed, divorced, separated, and married with civilian husband absent) not shown separately in table.

[3] In 1940, "married" includes only married women with husbands present in the household. In 1944 this category also includes married women with husbands absent in the armed forces. There are no available data on the number of women whose husbands were absent in the armed forces in 1940, but the number was not great enough to affect the figures significantly.

[4] The 1944 data presented in this table are based on a small cross-section of the population and are subject to a certain amount of sampling error. In general, estimates for categories containing 1,000,000 persons or more are subject to rather small sampling error and may be considered a reliable indication of the number of persons in these categories. On the other hand, the estimates for categories containing fewer than 1,000,000 persons are subject to larger sampling errors and should be interpreted as indicating only general relationships among the characteristics shown. The error that may be expected is proportionately largest for those categories having the smallest numbers.

[5] Number of persons in these categories too small to permit estimate on basis of 1944 sample statistics.

[6] Labor force as a percent of population. Rates for 1940 are based on total population, whereas rates for 1944 are based on the noninstitutional civilian population. Differences resulting from this incomparability, however, are insignificant.

This shift in marital status and the concomitant rise in birth rates would normally have caused a considerable reduction in the number of young women in the labor market, because of the obvious fact that most women do not ordinarily continue to work outside the home after they are married and the great majority of those who do continue to work do so only until they have children. In the age group 25–34, for example, the proportion of workers among single women in 1940 was 78.9 percent as compared with 33.4 percent among

[14] The birth rate in the United States rose from 17.9 per 1,000 of population in 1940 to 21.9 per 1,000 of population in 1943. (See Bureau of the Census: Vital Statistics—Special Reports, Vol. 19, No. 1, December 23, 1943; and Monthly Vital Statistics Bulletin, February 24, 1944.)

TABLE 4.—*Married Women Aged 18–64 in the Civilian Labor Force, by Age and Dependency Status, March 1940 and February 1944* [1]

Age group	All married women, 18–64 [2]				Without children under 10				With children under 10			
	1940 [3] total	1944 [4]			1940 total	1944 [4]			1940 total	1944 [4]		
		Total	Husband present	Husband absent in armed forces		Total	Husband present	Husband absent in armed forces		Total	Husband present	Husband absent in armed forces
	Number (in thousands)											
Total, 18–64 years	3,671	6,700	5,340	1,360	2,838	5,230	4,150	1,080	833	1,470	1,190	280
18–24 years	521	1,070	470	600	403	800	330	470	118	270	140	130
25–34 years	1,375	2,020	1,410	610	926	1,310	840	470	449	710	570	140
35–44 years	1,018	2,010	1,880	130	795	1,610	1,490	120	223	400	390	(5)
45–64 years	757	1,600	1,580	(5)	714	1,510	1,490	(5)	43	(5)	(5)	(5)
	Labor-force-participation rates (percent) [6]											
Total, 18–64 years	13.8	22.7	19.9	50.6	17.7	30.0	26.1	71.1	7.8	12.1	10.9	23.9
18–24 years	15.6	27.2	17.7	46.9	27.3	51.0	38.4	66.2	6.4	11.4	7.8	22.8
25–34 years	17.4	23.6	19.0	54.0	33.4	49.6	41.0	79.7	8.8	12.0	10.6	25.9
35–44 years	14.6	26.1	25.1	56.5	19.7	34.9	33.6	66.7	7.6	12.9	12.8	(5)
45–64 years	9.0	17.1	17.0	(5)	9.2	17.6	17.4	(5)	5.9	(5)	(5)	(5)

[1] Source: (1) March 1940—16th Population Census, 1940, The Labor Force (Sample Statistics), Employment and Family Characteristics of Women; (2) February 1944—Bureau of the Census, Monthly Report on the Labor Force.
[2] See table 3, footnote 3.
[3] Figures differ slightly from corresponding figures in table 3, since the data are based on different samples. For a description of the two samples, see 16th Population Census, 1940, Employment and Family Characteristics of Women, pp. 7 and 8.
[4] Data for 1944 are based on a small cross section of the population; see table 3, footnote 4.
[5] Number of persons in these categories too small to permit estimate on basis of 1944 sample statistics.
[6] See table 3, footnote 6.

TABLE 5.—*Marital Status of Women Aged 20–34 Years,*[1] *April 1940 and February 1944*

Marital status	Number of women (in thousands) aged—				Percentage distribution			
	20–24 years		25–34 years		20–24 years		25–34 years	
	1940	1944	1940	1944	1940	1944	1940	1944
Total	5,895	5,980	10,818	10,900	100.0	100.0	100.0	100.0
Single	2,781	2,440	2,050	1,640	47.2	40.8	18.9	15.0
Married, total	3,026	3,470	8,341	8,910	51.3	58.0	77.1	81.7
Husband present	2,850	2,310	7,933	7,430	48.3	38.6	73.3	68.1
Husband absent, in armed forces	(2)	1,020	(2)	1,130	(2)	17.1	(2)	10.4
Husband absent, other reasons	176	140	408	350	3.0	2.3	3.8	3.2
Widowed and divorced	88	70	427	350	1.5	1.2	3.9	3.2

[1] Source: Census Bureau Release PS—No. 1. Figures for 1940 refer to the total population, whereas figures for 1944 refer only to the civilian noninstitutional population. The exclusion of the relatively small number of women in the armed forces and in institutions, however, does not significantly affect the general comparisons shown.
[2] Statistics for the very small number of women with husbands in the armed forces in 1940 are not available.

married women with no young children and only 8.8 percent among married women with young children.[15]

The shift toward more young married women and more women with children has already been halted and reversed. Both the marriage rate and the birth rate have passed their wartime peaks and have entered a period of decline which is expected to continue until the war is over. The number of marriageable persons has been reduced to a low point by the many marriages in anticipation of military service and, in addition, millions of marriageable men and husbands are absent in the armed forces. The decline in marriages and births now under way should tend to keep up the rate of labor-market participation among young women, at least until the end of the war in Europe.

WOMEN OVER 35 YEARS OF AGE

Women between 35 and 65 years of age have been a major source of additional wartime labor, contributing 1.5 million to the total of 6.7 million extra workers in the labor force in April 1944. The rate of labor-market participation for this group exceeded normal expectations by approximately 25 percent (table 6). It is not surprising that the great majority of the extra workers among adult women are over 35 years of age. This group has been little affected by the wartime increase in marriage and birth rates. Moreover, there are large

TABLE 6.—*Estimated Labor-Force-Participation Rates, by Age and Sex, March 1940 and April 1944*

Age and sex	Labor force as percent of population			
	March 1940 [1]	April 1944 [2]		
		Normal	Actual	Percent excess of actual over normal
Total, 14 years and over	52.8	53.1	59.5	+12
Males, 14 years and over	79.7	79.3	86.4	+9
14–19 years	35.6	34.4	57.9	+68
14–17 years	19.2	17.3	40.5	+134
18–19 years	67.6	67.3	91.5	+36
20–24 years	88.5	88.5	97.2	+10
25–34 years	95.8	95.7	97.8	+2
35–44 years	95.4	95.0	97.2	+2
45–54 years	92.7	91.7	95.2	+4
55–64 years	84.6	83.3	89.9	+8
65 years and over	42.2	39.6	48.5	+22
Females, 14 years and over	25.7	27.1	32.8	+21
14–19 years	19.0	17.9	33.2	+86
14–17 years	7.6	5.9	19.8	+236
18–19 years	40.7	40.7	58.6	+44
20–24 years	45.6	46.9	53.8	+15
25–34 years	33.3	36.0	36.1	[3]
35–44 years	27.3	30.6	37.2	+22
45–54 years	22.4	24.0	31.0	+29
55–64 years	16.6	17.3	22.0	+27
65 years and over	6.0	5.6	6.3	+12

[1] Based on data from the 1940 Census adjusted for errors in classification (see Census Release P–44, No. 6) and for 150,000 members of the armed forces not included in the 1940 Census enumeration.

[2] Based on labor-force data described in table 2 (footnote 1) and population estimates from Bureau of the Census.

[3] Excess of less than half of 1 percent.

[15] Bureau of the Census, 16th Population Census, 1940, The Labor Force (Sample Statistics), Employment and Family Characteristics of Women.

numbers of married women over 35 normally outside the labor force and without responsibility for the care of young children. Of some 13.6 million married women aged 35–64 outside the labor force in 1940, 10.2 million or 75 percent did not have any children under 10 years of age. Among married women aged 18–34, on the other hand, there were 9.3 million not in paid work, of whom only 2.9 million or 31 percent were without responsibility for the care of young children.[16]

Very few women remain in the labor force after they have reached the age of 65 and the wartime experience has done little to change this situation. The few women in this age group who have postponed their retirement do not form a significant part of the extra wartime workers.

MEN 25–54 YEARS OF AGE

Wartime increases in labor-market participation of men aged 25–54 have necessarily been relatively small because there are very few able-bodied men of these ages who are not normally in the labor force. Even though about three-fifths of the men in this age group outside of institutions who were not in the labor force in 1940 had entered the labor market by 1944, the excess over "normal" amounted to only 700,000 or about 2 percent. For the most part these 700,000 are from the "fringes" of the labor market—the men who in pre-war days, sought work only occasionally or intermittently and the men on the borderline between employability and unemployability.

The men in this borderline group are the first to be discharged when business slumps and the last to be hired when business picks up again. For all practical purposes they are unemployable during a period of large labor surplus such as that which preceded the war. Many of these men were out of the labor market in 1940 because they had become convinced they were unable to work or because they were no longer willing to expose themselves to the rebuffs of the labor market after years of unsuccessful search for a job.

The 700,000 extra workers among men aged 25–54 probably include a significant number who, formerly, were occasional or intermittent workers. Since the "labor force" is defined to include only persons working or seeking work during a specific week, there is always a certain number of intermittent workers outside the labor force at any one time. It is "common practice for many migratory casual workers to spend part of the year on the road working or seeking work and then to withdraw from the labor market during the period when the chances of finding work are small." [17] The availability of steady jobs and the pressure of wartime demands for labor have probably reduced significantly the number of occasional workers who may be outside the labor force at any one time.

Another factor, which contributed about 100,000 to the excess over "normal" in the 25–54 age group, is the interruption of pre-war trends toward longer schooling and earlier retirement which had caused a slight downward movement in labor-market participation among men of this age.

[16] Figures quoted include only married women with husbands present.
[17] WPA Research Monograph VII: The Migratory Casual Worker, by John N. Webb. Washington, 1937.

MEN 55 YEARS OF AGE AND OVER

The interruption of trends toward earlier retirement was more important, however, among men over 55 years of age—particularly in the group over the age of 65. Although the percentage of these older men in the labor market would ordinarily have been expected to decline between 1940 and 1944, there was actually a considerable increase (table 6), so that the rate of labor-market participation exceeded normal expectations by about 22 percent for men aged 65 and over and about 8 percent for men aged 55–64. Altogether the labor force in April 1944 included about 800,000 extra male workers aged 55 and over. For the most part, these are men who have continued working beyond the age when they normally would have retired. In addition, some have reentered the labor force from retirement and others more nearly resemble the persons from the "fringes" of the labor market found in greater numbers among the extra workers under 55 years of age.

U. S. GOVERNMENT PRINTING OFFICE: 1944

J Hooker

WAR MANPOWER COMMISSION

Manpower Requirements and Labor Supply
July 1943--July 1944

Summary

A reappraisal of manpower needs for the current fiscal year on the basis of recently revised estimates of anticipated munitions production indicates two major revisions of previous estimates:

(1) Labor requirements in the munitions industries for July 1944 are now estimated at a considerably lower level than in earlier estimates.

(2) Estimates of non-industrial employment now point to a moderate decline in these branches of employment, rather than the substantial decrease indicated previously. Recent trends indicate that substantial declines on a nation-wide basis are not likely to occur, nor required.

The principal needs for additional personnel remain concentrated in the munitions industries, which will need 1,100,000 more workers in mid-1944 than were employed in July 1943, and in the Armed Forces, which will increase by 2,000,000 in net strength over the same period. Compared with earlier estimates, labor requirements in the munitions industries are reduced by 900,000 while manpower needs of the Armed Forces remain unchanged.

In summary, the needs for additional labor from July 1943 to July 1944 are as follows:

Armed Forces	2,000,000
Munitions and munitions materials industries	1,100,000
Transportation, fuel, and utilities	100,000
Food industries	100,000
Total	3,300,000

About half of the net requirements may be met by workers shifting from other employment, where labor requirements will be reduced; the other half will be supplied by nonworkers entering the labor force. That this further expansion of the labor force is within reach of fulfillment is suggested by the 4,300,000 increase which occurred from July 1942 to July 1943, and is confirmed by examination of remaining labor reserves.

The sources of labor supply for meeting the estimated additional labor requirements from July 1943 to July 1944 are summarized below:

Reduction in employment in non-munitions industries		1,600,000
Construction	700,000	
Building materials	100,000	
Other manufacturing	100,000	
Nonindustrial employment 1/	600,000	
Agriculture	100,000	
Reduction in unemployment		200,000
Net increase in labor force		1,500,000
Total		3,300,000

Although the supply of workers in the nation as a whole is expected to be more than adequate to meet anticipated needs, there may be serious difficulties in attaining required levels of employment in munitions plants located in areas of labor shortage.

Manpower Needs, July 1943--July 1944 (See Chart 1)

Armed Forces.--The greatest single demand for manpower over the year is that of the Armed Forces. No changes are indicated from previous estimates of an increase of 2,000,000 in the net strength of the Armed Services. Since this estimate is net, it does not take account of replacements for casualties and discharges. In terms of the number who will have to be inducted into the services, this estimate must be considered a minimum.

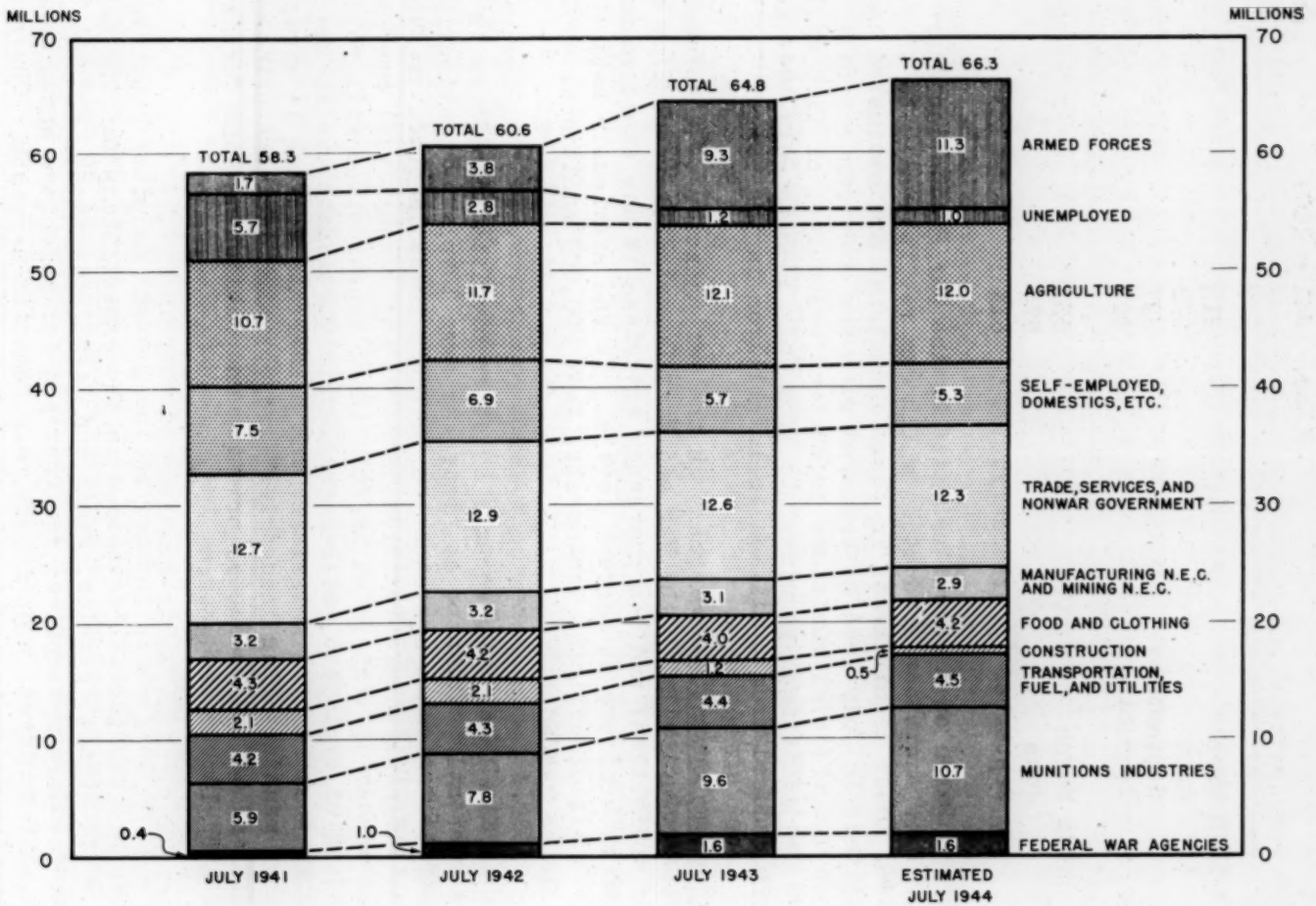
Munitions industries.--Labor requirements of the munitions industries--which include principally the metal-using industries, metal mining, and selected chemicals and rubber industries--are now estimated at nearly a million less in July 1944 than were previously anticipated. The estimates published jointly by the Bureau of Labor Statistics and the War Manpower Commission, June 28, 1943, were based upon the War Production Board's current summary of official munitions output and war construction schedules for 1944. Since then, the War Production Board has estimated that a somewhat lower level of munitions production may more reasonably be expected in 1944. Among the reasons given for the belief that "we are approaching our production ceiling" are the recent diminution in the monthly rate of increase of munitions production, anticipated cut-backs in the programs for some items for which requirements are reduced by the changing military situation, and the fact that schedules for some types of equipment had been set at ambitiously high levels which may be modified downward. The reduced rate of increase in recent months is shown

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1/ Includes wholesale and retail trade; finance, service and miscellaneous; state and local government; federal agencies not included in the federal war agencies group or in the munitions industries; self-emoloyed, proprietors, and domestic servants.

CHART I

CHANGES IN THE SIZE AND DEPLOYMENT OF THE LABOR FORCE FROM JULY 1941 TO JULY 1943 AND ESTIMATED MANPOWER REQUIREMENTS IN JULY 1944



SOURCE:
WAR MANPOWER COMMISSION
AND
BUREAU OF LABOR STATISTICS

WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE

in the following tabulation of the quarterly percentage increase in the index of munitions production compiled by the War Production Board:

	Index (Nov. 1941 = 100)	Quarterly percentage increase
1942 March	213	60.2
June	309	45.1
September	387	25.2
December	497	28.4
1943 March	530	6.6
June	573	8.1
September (preliminary)	614	7.2

Based on a recent estimate by the War Production Board of the level of munitions production which may realistically be expected in 1944, labor requirements in these industries are estimated to be 10.7 millions in July 1944 as compared with the previous estimate, based upon the official munitions production schedules, of 11.6 millions. The net additional requirements from July 1943 to July 1944 are therefore reduced from 2 million to 1.1 million in the present estimate.

Other employment.--Employment in the war agencies of the Federal government--principally in the War and Navy Departments (excluding manufacturing activities) and the emergency agencies--is now expected in the aggregate to continue at current levels. It was previously anticipated, on the basis of official statements, that 300,000 additional employees would be needed.

The labor requirements of other civilian industries in July 1944 are currently estimated at about the same levels as previously indicated. Moderate increases are expected in labor needs in food, transportation, fuel and utilities. Textiles, apparel and leather will need about the same number of workers as in July 1943; construction will release large numbers of employees, with a smaller proportionate cut in the industries making construction materials; and a moderate decline is expected in the "other manufacturing industries" group, which includes principally tobacco, paper and allied products, printing and publishing, and furniture and finished lumber products.

The only other changes in the present manpower requirements estimates are substantial revisions in the expectations for the nonindustrial segments--trade, service, State and local government, Federal Government (other than war agencies, requirements for which are shown separately), and self-employed, proprietors, and domestic servants. The estimates now suggest a moderate decline in these branches of employment, rather than the substantial decrease indicated in the earlier estimates. With respect to such activities, for which there is no programming on a national scale, the present estimates do not reflect requirements but rather expectations

of probable levels of employment. Although in some war production communities additional workers are needed in these activities, the manpower so employed in the country as a whole could be curtailed considerably, if necessary. The reduced munitions labor requirements, however, and the elasticity with which the labor force has already expanded indicate that declines of the magnitude previously considered necessary are not likely to occur. Because these activities are widely distributed over the country and can more readily utilize the skills of persons remaining in the Nation's labor reserves, it appears possible for non-industrial employers to maintain their work force only slightly below the levels of July 1943 without impeding the necessary expansion of munitions employment and the Armed Forces.

Sources of Labor Supply

Declines totalling 1,600,000 are indicated in labor requirements in various segments of employment, including 100,000 in agriculture. Hence, nearly half of the net additional requirements can be met if all the workers released from these industries find their places in the expanding segments, including the Armed Forces. The construction industry, which is expected to decline by 700,000 in the 12-month period, will provide a substantial pool of workers who have the types of skills adaptable to war production, and are accustomed to migrate to available jobs. Many non-industrial employees, not inducted into the Armed Forces, will require retraining before they can be absorbed in the expanding industries.

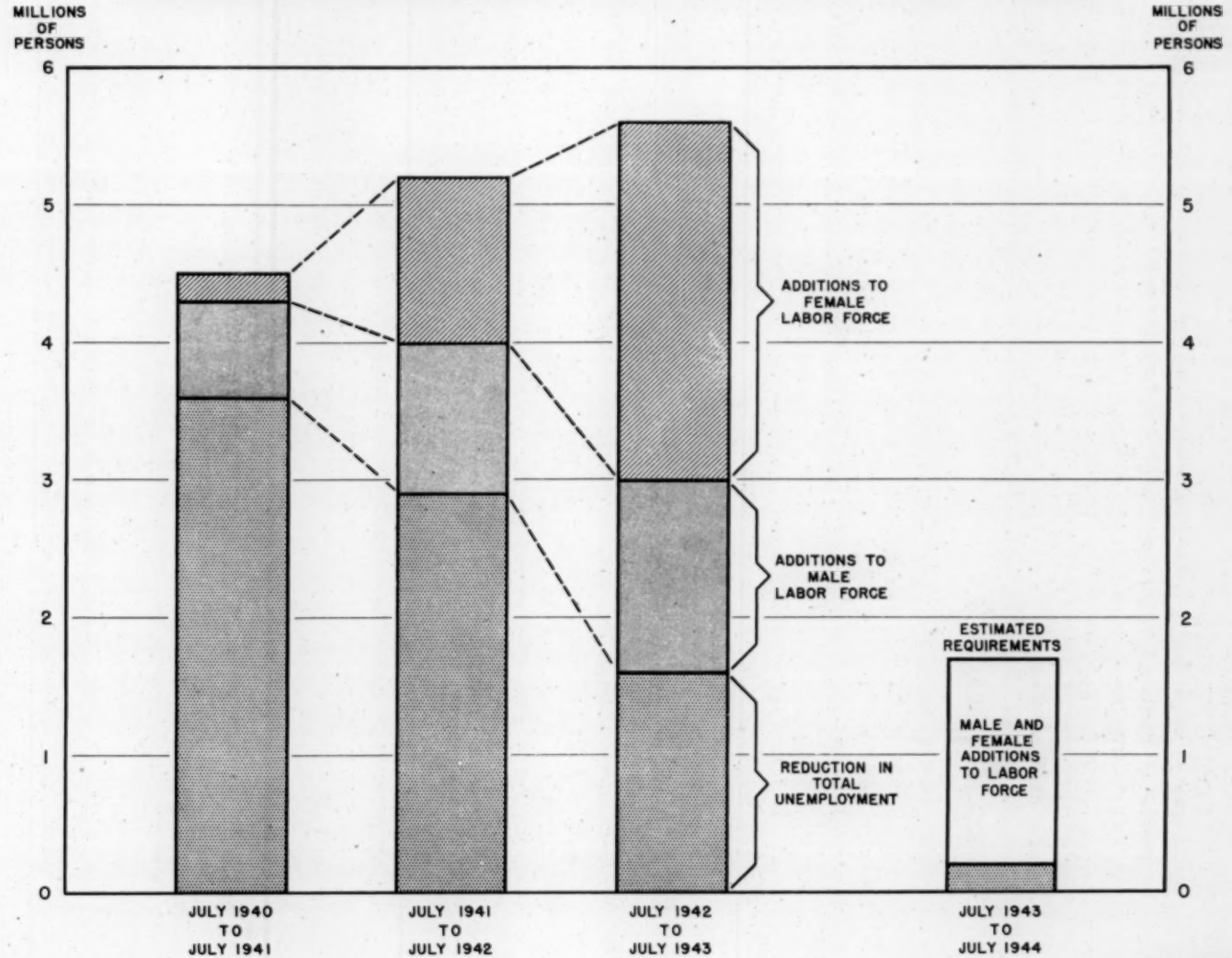
The balance of the requirements will have to be met by the entry of nonworkers into the labor force. Unemployment can no longer be depended upon as a substantial source of labor for expansion of the working population. The number of unemployed has fluctuated around 1,000,000 through 1943. Because of between-job shifts resulting from changes in production schedules and other causes, it is expected that unemployment will continue to fluctuate at approximately this level, with possibly some seasonal increase in the summer as students temporarily go into the labor market. Assuming the 1944 seasonal peaks in both unemployment and agriculture to be somewhat lower than in 1943, the number of nonworkers needed in the labor force in July 1944 to meet total requirements will be 1,500,000, as shown in the summary on page 2.

Wartime Expansion of the labor supply.--The labor force has grown phenomenally during the war, increasing by 900,000 in the year ending July 1941, by 2,300,000 in the next year, and by 4,200,000 in the year ending July 1943. Because of the decrease which took place in unemployment, the number of persons at work or in the Armed Forces increased even more--4,500,000 in the first year, 5,200,000 in the second, and 5,800,000 in the third--a total of 15,500,000. (See Chart 2)

As would be expected, women represented the greater part of these additions to the labor force. Of the 7,400,000 persons entering the labor force in the three years, 4,000,000 were women. Since the net annual increase in the labor force due to population growth is approximately half

CHART 2

YEAR-TO-YEAR CHANGES IN EMPLOYMENT PLUS THE ARMED FORCES, 1940-1941, 1941-1942, AND 1942-1943, CLASSIFIED BY CHANGES IN THE NUMBER OF UNEMPLOYED AND THE TOTAL LABOR FORCE



SOURCE:
WAR MANPOWER COMMISSION
AND
BUREAU OF LABOR STATISTICS

WAR MANPOWER COMMISSION
REPORTS AND ANALYSIS SERVICE

a million men and women, the net addition of 1,500,000 persons to meet manpower needs would require an additional net increase in the labor force of about a million--mostly women.

Including the increase due to population growth, the net requirements for additional women in the labor force for the 12-month period ending July 1944 number 900,000, bringing the total female labor force to 18.7 million as compared with 17.8 million in July 1943. Of the 900,000 increase, 200,000 are expected to be required for the Armed Forces and 700,000 for the civilian labor force. Employment of women in munitions industries must increase from 2.4 million in July 1943 to 3.0 million by July 1944. Employment of women in all other activities is expected to increase by 300,000, resulting in a total increase of 900,000 in the employment of women--from 17.1 million in July 1943 to 18.0 in July 1944. Unemployment of women is expected to drop by 200,000 from the already very low number of unemployed--600,000 in July 1943.

That the expansion of the labor force by an additional 1,000,000, over and above the annual increase due to population growth, is feasible is confirmed by an examination of the remaining labor reserves among women. The major source of potential labor supply is the group of 29,000,000 women engaged in their own housework in July 1943. Among these were about 11,000,000 in the category which may be considered most available for labor market participation--namely, women who reside in nonfarm areas and are, therefore, most likely to be near centers of industrial activity, and who also do not have any children under 14 in the household. A little over three and one-half million of these workers were under 45 years of age, and it is from this group that most, although not all, of the additional 1,000,000 workers will have to come.

Local Character of Manpower Requirements

While the manpower resources of the country as a whole appear to be ample to meet essential requirements, many of the persons available for work live in localities far from the jobs which have to be filled. The most difficult problems in manpower mobilization in the coming year will center in a limited number of areas where the labor demands of expanding war plants, together with the needs of consumer services, which are strained to supply a rapidly increasing local population, have created serious shortages of labor. These industries on which fall the heaviest burdens of further expansion in munitions output--aircraft and shipbuilding--are perhaps most affected by such labor shortages. Nearly seven-eighths of the workers in aircraft assembly plants and the same proportion of the shipbuilding workers in July 1943 were employed in areas currently experiencing labor shortages or areas in which shortages were expected in the near future. Furthermore, eight-tenths of the additional workers required in aircraft plants to raise production to programmed levels, and nine-tenths of the additional shipbuilding workers will have to be hired by plants in labor shortage areas.

The problems of meeting the labor requirements of these areas are complicated by shortages of housing and local community services. With inmigration of additional workers limited by these factors, it becomes necessary to rely chiefly upon the persons already living in the areas. Channeling of workers into the jobs in which their skills are most needed, recruitment of nonworkers into the labor force, reducing unnecessary turnover, and the promotion of efficient utilization of labor already employed are the principal means by which this problem can be approached through manpower controls. The cooperation of various government agencies has to be sought in these situations where the production load on a community proves to be greater than its available manpower can handle.

Prepared by: War Manpower Commission
Reports and Analysis Service, and
U. S. Department of Labor,
Bureau of Labor Statistics
November 20, 1943

7-2909 PS bu

Estimated Manpower Requirements
July 1943 to July 1944 1/

	Actual			Estimated requirements
	July 1941	July 1942	July 1943	July 1944
	(in millions)			
Armed Forces 2/	1.7	3.8	9.3	11.3
War Industries				
Munitions industries 3/	5.9	7.8	9.6	10.7
Federal war agencies 4/	.3	1.0	1.6	1.6
Transportation, fuel, utilities 5/	4.2	4.3	4.4	4.5
Total	10.4	13.1	15.6	16.8
Other Industries				
Construction 6/	2.1	2.1	1.2	.5
Food industries 7/	1.4	1.4	1.4	1.5
Textiles, clothing, leather 8/	2.9	2.8	2.7	2.7
Manufacturing n.e.c. and mining n.e.c. 9/	3.2	3.2	3.1	2.9
Total	9.6	9.5	8.4	7.6
Nonindustrial employment 10/	20.2	19.7	18.2	17.6
Agriculture	10.7	11.7	12.1	12.0
Unemployment	5.7	2.8	1.2	1.0
Total labor force, including Armed Forces	58.3	60.6	64.8	66.3

1/ All data apply to approximately the tenth day of the month, except the Armed Forces figures which relate to the first of the month.
2/ Net strength. Excludes net attrition due to battle casualties or other causes.
3/ Includes all metal-using industries, metal mining, coke-oven products, abrasives, selected chemicals and rubber industries.
4/ Excludes Navy Yards and manufacturing arsenals included in munitions group, as well as off-continent and force-account construction employment of war agencies.
5/ Includes transportation and public utilities, coal mining, and petroleum production, drilling, and refining.
6/ Includes contract construction and federal force-account construction.
7/ Includes food manufacturing and tin cans.
8/ Includes textiles, apparel, leather, rayon and allied products, and rubber boots and shoes.
9/ Includes tobacco, paper and allied products, printing and publishing, lumber, furniture and finished lumber products, parts of the chemical, stone, clay, and glass industries, miscellaneous manufacturing, quarrying and non-metallic mining.
10/ Includes trade, service, State and local government, Federal government (except war agencies, Navy Yards and manufacturing arsenals), self-employed, proprietors, and domestic servants.

Sources: July 1941 to July 1943 data for civilian labor force, unemployed, employed, agricultural and nonagricultural employment, from Monthly Report on the Labor Force, Bureau of the Census. July 1941 to July 1943 data for components of nonagricultural employment from Bureau of Labor Statistics. Data on Armed Forces from published statements. Estimates for July 1944, except Armed Forces, by Bureau of Labor Statistics and War Manpower Commission, Reports and Analysis Service, with the cooperation of the Planning Division of the War Production Board.

War Manpower Commission
Reports and Analysis Service, and
U.S. Department of Labor,
Bureau of Labor Statistics
November 20, 1943

February 25, 1944

Mr. J. C. Capt, Director
Bureau of the Census
Department of Commerce
Washington 25, D. C.

Dear Mr. Capt:

I wish to acknowledge the set of tabulations on marital status and number of children, that were enclosed with your letter of February 21.

I believe the information available from the proposed tables will adequately meet our current needs on the subject.

Sincerely yours,

Mary Anderson, Director

JMH:ml

February 18, 1944

Mr. J.C. Capt, Director
Bureau of the Census
Department of Commerce
Washington 25, D. C.

Dear Mr. Capt:

We have reviewed the proposed instructions for the March 1944 supplementary questions on the Monthly Report on the Labor Force. We have already suggested in a telephone discussion with Dr. Eckler's Office that "Oth." (footnoted) in column 16 be defined explicitly to include persons currently in the household who were during the week before Pearl Harbor in institutions, in the armed forces, or outside of continental United States, as well as those customarily classified as "Oth." We have no further comments to make.

Sincerely yours,

Mary Anderson, Director

JMH:ml

Not File Copy

February 15, 1944

Mr. J. C. Capt, Director
Bureau of the Census
Department of Commerce
Washington 25, D.C.

Dear Mr. Capt:

I am enclosing three tables which are additional to Nos. 1 to 6 already sent you. The attached Tables 7, 8 and 9 are proposed on the basis of the broadened coverage of the special questions to be asked on the March 1944 Monthly Report on the Labor Force.

Undoubtedly some of this material will be wanted by other agencies too due to general interest in the gross shifts in the labor force since Pearl Harbor. We wish, however, to indicate through these table forms which of the more comprehensive data will be of particular value to the Women's Bureau, and to give you an opportunity to consider as a whole the information as to women we should like the survey to provide.

Sincerely yours,

Mary Anderson, Director

Enclosures
JAHiml

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

BACKGROUND MATERIAL AS TO WOMEN IN THE LABOR FORCE

Arrangements are being made for the following additional questions to be asked on the Bureau of the Census Monthly Report on the Labor Force for March:

(1) For all persons 14 years and over, enter activity during week before Pearl Harbor, December 1-6.

(2) If at work or had a job during the week before Pearl Harbor, enter occupation and industry of that job.

It is expected that the material thus obtained also will be tied in with the extra marital status question to be asked on the Census schedule in February. In this way it is expected to be possible to obtain the following types of information as to women in the labor force:

(1) Labor force status now and before Pearl Harbor.

(2) Industry group now, by industry group before Pearl Harbor.

(3) Current industry and occupation group by labor force status before Pearl Harbor.

(4) Marital status now, by labor force status before Pearl Harbor.

(5) Age now, by labor force status before Pearl Harbor.

(6) Age and marital group now, by whether or not in labor force before Pearl Harbor.

Certain additional points also are being considered, depending on adequacy of funds for obtaining further tabulations.

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

STUDY OF WOMEN WAR WORKERS' NEEDS IN THE COMING TRANSITION PERIOD

Studies designed to aid women workers with their adjustments in the transition period after the war should consider plans of the women themselves in the light of the economic responsibilities that they must carry.

Women Permanently in Labor Force Before War

Before the war some 13 or 14 million women were regularly in this country's labor force. In fact, nearly one-fourth of all persons employed before the war were women. Many of these have shifted into fields of work different from those in which they had been engaged. Other women have newly entered employment.

All told, war demands have brought the number of women in the labor force up to well over 17 million. Some of these women already are being laid off in certain areas, while in others there still is a shortage of women workers. At the close of the war, it is likely that many more women will lose jobs.

Women in Labor Force After the War

Many of the women who have taken jobs during the war will want to return home after the war. But as just pointed out many were a permanent part of the labor force before the war, and others must continue as workers. Even as early as 1930, the great majority of our larger cities had more women than men in their population. This situation is likely to be a growing one. It is plainly one that requires many women to continue as earners. After the war the permanent labor force may include 2 or 3 million more women than in 1940.

Importance of Planning Now for Post-War Needs

America's victory will be measured chiefly by our ability to perform an orderly transition. The extent to which this country can set its own economic house in order will be a large determinant in assuring the objectives for which we are fighting and in securing future peace.

The Present Study

Women war workers must be helped to adjust, to find other employment or new lines of work if necessary. Background information as to the economic problems they must cope with is important to enable their needs to be met by wise policies, and to aid the public in understanding their permanence in the labor force. This study seeks to find out from these women:

Whether they are normally a part of the labor force.

If new workers, whether they expect to remain in the labor force or to return home.

Whether they desire work of the type they are now doing or wish a different type of occupation.

Whether they have come into a new community for war work, and whether they desire to remain there, to return to their former home, or to go elsewhere.

What their economic responsibilities involve, the extent to which their earnings are necessary for support of their families.

Where the women visited make comments of value in the foregoing questions, these will be of importance in rounding out the broad picture of the needs of women war workers in the transition period.

U. S. Department of Labor
WOMEN'S BUREAU
Washington

Leave blank

Post War and Optimum Hour Study

Plant 1___ 2___ Other - check: [-] [+]

City _____
Plant _____
Product _____
Department _____
Job _____
Hours _____
Method of pay _____
E.O.D. and left _____
Pl. _____
Job _____

Employee Interview

1. Name _____ 2. Address _____

Personal Data (Circle appropriate item)

Code (disregard):	1	2	3	4	5	6	7	8	9	X
3. Race	W	N	O							NR
4. Age	14-17	18-19	20-24	25-29	30-34	35-39	40-44	45-49	50 and over	NR
5. M. S.	Single	M.P.S.	M.P.N.S.	M.A.S.	M.A.N.S.	W.D.				NR
6. Total time in this ~~job~~ occ.	Less 3 mos.	3 U 6 mos.	6 mos. U 1 year	1 U 2 years	2 U 3 years	3 U 5 years	5 U 10 years	10 U 25yrs	25 yrs. & over	NR
7. Usually gain-fully employed:	Yes	No	Industry _____ ~~Job~~ Occ. _____							NR
8. Total time worked	Less 3 mos.	3 U 6 mos.	6 mos. U 1 year	1 U 2 years	2 U 3 years	3 U 5 years	5 U 10 years	10 U 25yrs	25 yrs. & over	NR
9. Status month before P. H.	Emp.	Public Emerg.	Seeking	H.F.	School	Other				NR

10. If employed month before Pearl Harbor: Industry _____ ~~Job~~ Occ. _____

Code (disregard):	01	02	03	04	05	06	07	08	09	10	11	12	13	XX
11. Schooling	-G6	G6	G7	G8	H1	H2	H3	H4	C1	C2	C3	C4	C5 & over	NR

Comments:

Agent _____
Date _____

Post War Study Only

12. ~~After the war~~ do you expect to:

(check only one)

a. Stop work
   3 1. ~~at once~~ Immediately at End of war _____
   2. When earner(s) return from service _____
   1 3. When war job ends _____
   4. Other (explain) _____

(check one or more)

b. Continue indefinitely
   5. Need support self _____
      other(s) _____
   6. Money for special purpose(s) _____
   7. Like employment _____
   8. Like having own money _____
   9. Other (explain) _____

13. Do you want: Same occupation if possible? (1) Yes _____ (2) No _____

14. Occupation desired, if other: _____

15. Reason for wanting occupation change: _____

Migration

16. Residence before Pearl Harbor (a) State _____ (b) Community _____
    Farm: (1) Yes _____ (2) No _____
    (c) Did any of immediate family remain in former community? (1) Yes _____ (2) No _____

17. Residence planned after war: (1) No change _____ (2) Return previous _____
    Other place _____ State _____ Community _____

18.

Earnings and contributions of worker	Amount	Period	(For office use) Amount	Percent
Take home earnings				
Regular contribution to household				
Regular contributions to others (outside of household)				

Special contributions made by worker in last six months to other family persons outside of the household. Explain: _____

Post War and Optimum Hour

19. Worker living in family household _____ : Apart (1) Board and room _____
(2) Other (explain) _____

20. Family household (exclude lodgers, servants)

Member (relationship to worker)	Number of members	Number of earners	Number of earners contributing to household
Total number:			
Worker			

Members 14 years and over

21.

Children in household (Under 16 years) Age	Total	Own
Under 2 yrs.		
2 - 5 years		
6 - 9 years		
10 - 13 years		
14 - 15 years (Entered in 20 also)		

22. Describe any difference in household during 1st period (for hour study only):

23. List relationship to worker of service persons contributing regularly:

24. Other sources of income: _____

Date _____

January 7, 1944

Mr. J. C. Capt, Director
Bureau of the Census
U. S. Department of Commerce
Washington 25, D. C.

Dear Mr. Capt:

The Women's Bureau wishes to obtain some special information through the addition of supplementary questions to the regular current survey of the labor force. If possible, we should like to have the information as of March 1944 but in any case not later than May. Will you let us know the approximate cost of such a project, and whether it can be carried out for March?

We understand that plans are now under way for obtaining marital status through a special edition of the regular schedule in February. If techniques could be worked out so that this information can be related to the subsequent month without disproportionate expense, thus permitting more information along other lines, we would like to have the questions for March. However, if this is impractical, then April or May, but not later, would be satisfactory.

The additional questions required would be along the following lines:

1. For women currently employed, labor force status before Pearl Harbor and, if in the experienced work force at that date, occupation field.

2. For women currently in the labor force, marital status and, if married, whether or not husband is in service.

Though we have not considered in detail the tabulations we shall need, in general they would provide the following information:

1. Broad field of work of women currently employed, by broad field of work before Pearl Harbor (e. g., a) service workers, b) forewomen, operatives, and laborers, c) clerical, sales and related, d) professional, managerial and related, e) agricultural workers, f) engaged in home housework, g) in school, h) other.)
2. Age of women currently in the labor force, by labor force status before Pearl Harbor.

3. Marital status of women currently in the labor force (including, for married women, whether or not husband is in service), by labor force status before Pearl Harbor.

4. Possibly, for selected areas, marital status of currently employed women, by labor force status before Pearl Harbor.

Sincerely yours,

JMH:pao

Mary Anderson, Director

See REACT, Page 2, Column 6

See ANGLY, Page 6, Column 1

Including Armed Forces

U. S. Work Force Slated to Total 66.3 Millions by Next July

By Ben W. Gilbert

The Nation has started on "the last, but hardest and most crucial lap of manpower mobilization," William Haber, assistant executive director of the War Manpower Commission stated yesterday after revealing that the national work force is scheduled to rise to an all-time high of 66.3 million persons (including the armed services and agriculture) by July 1, 1944, from 64.8 millions last July.

Haber announced revisions of WMC manpower estimates which revealed that munitions industries employment is scheduled to expand 10.7 millions by July, 1944, instead of 11.6 millions, a saving of 900,000 attributed to curtailment of munitions programs.

However, because of a previous overestimate of the amount nonwar employment would decline during the 1944 fiscal year period (July to July), a total of 1.5 million persons must be added to the work force, instead of the 1.3 millions previously scheduled, Haber said.

Haber pointed out that the manpower job—increasing our armed forces from 500,000 in July, 1940, reducing the unemployed from 9 million in 1940 to about 700,000 currently, and increasing the total work force to unprecedented levels—was accomplished without the use of national service (labor draft legislation.

He expressed the opinion that the job could be finished without

See MANPOWER, Page 10, Col. 3

Armed Forces Increased 700,000 Since July

The armed forces have increased only 700,000 since July 1 to a November 1 level of 10 millions, figures released by the War Manpower Commission revealed yesterday, indicating that they will fail to meet their year-end goal of 10.8 millions by a substantial amount.

It was pointed out that current monthly calls of 300,000 for the armed forces allow about 70,000 for replacements. On this basis the estimated year-end net strength of the armed forces would be about 10,460,000, or 340,000 short of the goal.

Officials cautioned that current estimates could be 100,000 in error, but acknowledged that a deficit of 200,000 to 300,000 or possibly more is expected.

10 Poems 28 Deserves

1.3 Millions Face Call by July

MANPOWER, from Page 1

national service legislation, explaining that he did not hold to that view some months ago.

Defending the record of WMC from charges that it has left the manpower picture a "muddle," Haber stated that WMC never asked for a reduction in production schedules to solve manpower problems, nor did the labor supply picture force a reduction in the civilian standard of living.

In summary, the needs for additional manpower from July, 1943, to July, 1944, are as follows:

Armed forces, 2,000,000; munitions and munitions materials industries, 1,100,000; transportation, fuel, and utilities, 100,000; food industries, 100,000—total additional needs, 3,300,000.

The following amounts of labor must be drawn from the following sources to provide the needs:

Construction, 700,000; building materials, 100,000; non-munitions manufacturing, 100,000; trade and service, nonwar Government domestic servants, and miscellaneous, 600,000; agriculture, 100,000; reduction of unemployment, 200,000; employment of additional workers not now in work force, 1,500,000—total provided: 3,300,000.

As of November 1, a total of 9.8 millions were listed in munitions industries, with 10 millions in the armed forces, compared with 9.6 millions in munitions last July 1, and 9.3 millions in the armed forces. Between November 1 and next July, 900,000 workers must be added to munitions industries, with 1.3 millions added to the armed forces.

WMC attributed the revision in munitions employment figures to the overall cutback in the war program "dictated by military experience and strategy," reducing the 1944 production schedule from 82.4 billion dollars to 76.7 billions.

Another "saving"—of 400,000 workers—was made in the revision by assuming that employment in Federal war agencies would remain constant at the July, 1943, figure of 1.6 millions, instead of increasing to 2 millions as expected. The war agency employment figures covered all the alphabetical war agencies and the War and Navy Departments, exclusive of military personnel and workers employed in arsenals and Navy yards.

Employment leves in trades and services are now expected to drop only 100,000 from the July, 1943, estimate of 10.6 millions by July, 1944, instead of to the earlier estimate of 9.9 millions.

Haber stated that the WMC miscalculated the amount nonwar employment would decline because of a variety of factors, including the Government's failure to adopt a thoroughgoing program of concentration of civilian production, comparable to the one in effect in Britain.

It was also found that many nonwar activities took on an "essential" character in war-crowded communities, making it inadvisable

defeat of the national unity that we

Turn to Democrats, page 20, col. 4

thunderclouds and smoke screens so

Turn to AIR WAR, page 2, col. 1

1,750 Workers Are Idle in Motor Plant 'Holiday'

A work holiday that union leaders said might shortly become a strike kept 1,750 productions workers idle Wednesday at the Harley-Davidson Motor Co., 3700 W. Juneau av.

The company is engaged primarily in manufacturing motorcycles for the army, but it also produces a smaller number of motorcycles for the navy and has other war subcontracts. All production was stopped. Only 200 office workers and approximately 100 foremen were on the job Wednesday.

The dispute between the company and the union, Local 209 of the United Automobile Workers (AFL), is over interpretation of a war labor board directive setting up a new wage rate range for the 125 workers in the company's prepack department. They are all women.

Asked Rate Range

These women, like other women employes at the plant, have been starting at 55c an hour with automatic increases every three months. Last November the company and union applied to the war labor board to set up a wage rate range for that department, which is a new department born of the war. The workers dip parts for export in wax and wrap them in weatherproof paper.

After seven months delay, the WLB on Saturday directed that the department's rate range should be from 65c to 78c an hour. The women are presently receiving from 55c to 65c an hour in that department. The increases were to be retroactive to Nov. 11, 1943.

According to Gordon Davidson, vice-president of Harley-Davidson, the company believes that all workers in that department should be placed at 65c an hour with subsequent increases on a merit basis. Leonard Hackert, president of the union, said the union believes the workers should be transferred into the new rate range on a seniority basis—in other words, they should be placed in the same position in the

Turn to MOTORS, page 17, col. 2

Motors

From page 1, column 3

65c-78c scale as they now have in what amounts to a 55c-65c scale. Under the union's interpretation, the highest pay at present would fall at 75c an hour. The union believes increases should be given according to length of service.

As a compromise, Davidson offered to go up to 70c an hour on a seniority basis, but he insisted that raises after that should be on a merit basis. However, he said he did not believe this was the intent of the war labor board's directive and he said he would first have to get a WLB interpretation. The union rejected this compromise.

Hackert said that the women in the prepack department wanted to walk out twice Tuesday but were restrained by the union's bargaining committee, which met for most of the day with company officials. They decided Tuesday night to take a "work holiday."

One clause of the union's contract with the firm reads:

"In the event of a serious major controversy between the company and the union, the union shall have the right to call a one day work holiday. This call shall not be used more than twice in any one calendar year."

Hackert said that the present stoppage was regarded by the union as a work holiday under its contract, but he added:

"If the dispute is not settled, I suppose it will become a strike."

Hackert said that none of the union members were told not to go to work.

Decided to Stay Out

"We told the men, when they reported to work Wednesday morning, that no one had to stay out of the plant. We said the women were determined not to go to work until something was done about the rates and the others could do what they wanted to about it. They decided on their own not to work."

Hackert said the union regretted that the stoppage had come the day after D day but that it was unavoidable.

"The girls have been waiting for many months for this to be settled," he said. "The invasion also waited for many months. It is a coincidence that they came together. We are a loyal union and 527 of our local's members are now in the armed services. We have never asked for a deferment for any man for union reasons."

The company Wednesday notified the army and navy of the work stoppage. It also informed the Chicago regional office of the department of labor, conciliation department.

Maj. James P. Holmes, United States conciliation department director here, was attempting to arrange a conference between the disputing parties for Wednesday afternoon.

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Pledge No Cessation

A pledge to "continue to deliver the goods without cessation until full victory is won" was made by the joint council of Local 248, UAW-CIO, Allis-Chalmers workers' union, in messages to President Roosevelt and Gen. Eisenhower Tuesday.

"Fifteen thousand war workers, members of Allis-Chalmers workers' union, UAW-CIO, back the action of our military leaders in opening the second front in Europe," the message to the president said. "Our thoughts and hopes are with the heroic men of the liberating armies of the Allies and we pledge to continue to deliver the goods without cessation until full victory is won."

Illinois

In the period from Aug. 15 to Sept. 8 women filed 54.8 percent of the jobless pay claims in Illinois, while they were 47.3 percent of the workers laid off during that time, according to State Department of Labor reports. In Chicago alone 48,997 women, almost 100 percent of those laid off, filed claims. About 35.3 percent of all jobs available in Chicago during these three weeks, were for women (Ill. State Fed. of Labor Wkly. New Letter, Oct. 13, 1945.)

Discrimination

The following "typical" case was reported to the CIO office. A woman worker interviewed for unemployment compensation gave her experience as: arc welding - 9⅓ months, elevator operating - 8 months, crane operating - 3 months. Her application card was given to her listing only her experience as an elevator operator - the poorest paid job of the three. This excluded her from being referred to jobs at her highest skill. (Wisconsin CIO News, Oct. 12, 1945.)

EMPLOYMENT OF WOMEN

Cutbacks

B.L.S. reports a net decline in manufacturing industries of 1,600,000 in August following cutbacks after VJ-day. Data were obtained by a telegraphic survey of representative concerns in 19 major manufacturing industries. Seven-eighths of the cut was in metal, chemicals and rubber industries. There were increases in tobacco and leather and little change in lumber, food, paper and stone, clay and glass. (N.Y. Times, Sept. 10, 1945)

Missouri - Unemployed

U.S.E.S. estimates that more than 60,000 workers have been put out of work in St. Louis by contract cancellations, with 10,102 job openings available. About 6,000 workers are being referred to jobs weekly with only half accepting, chiefly because wage rates are lower than in war jobs. (St. Louis Globe-Democrat, Sept. 7, 1945)

Detroit, Michigan

About 200,000 war workers were unemployed in the Detroit Area as of Aug. 24. A recent administrative ruling of the Mich. Unemployment Compensation Commission provides that skilled workers who formerly held unskilled jobs must accept work at their lowest skill (if necessary?) or lose rights to unemployment compensation. Such jobs pay comparatively low wages. Women, who comprise three-fourths of the currently unemployed are particularly affected as the majority were unskilled before entering war work. Union has announced that they will fight this ruling through the courts. A woman who leaves work to move with her husband or family to another locality is also disqualified.

As of Aug. 23 only 8,000 jobs were available for the 200,000 unemployed according to WMC. These were distributed as follows: Skilled, 30 percent; unskilled, largely construction, 25; semi-skilled, mostly construction, 15; clerical, sales or service, 25; professional or administrative, 5. (Detroit Free Press, Aug. 7, 8, 23 and 24, 1945)

Michigan - Automobiles

About 150 women displaced from wartime jobs were picketing the Ford Highland Park Plant November 8. They established the picket line because they said 2,200 men without seniority had been hired, while 5,000 women war workers had not yet been recalled. They said they would continue picketing until their seniority rights were secured. The president of the local said less than 300 women are now employed compared with 5,849 at the wartime peak. Ford officials said women are not being hired now because manufacture of tractors is too heavy for them. (N. Y. Times, Nov. 9, 1945)

New York - Cutbacks

Field representatives of the State Department of Labor visited 1,400 industrial establishments, and on the basis of their statements have reported layoffs in the seven weeks since V-J Day.

Total in State 291,000 - 174,000 or 60 percent women. There is a widespread tendency on the part of most employers to replace women with men.

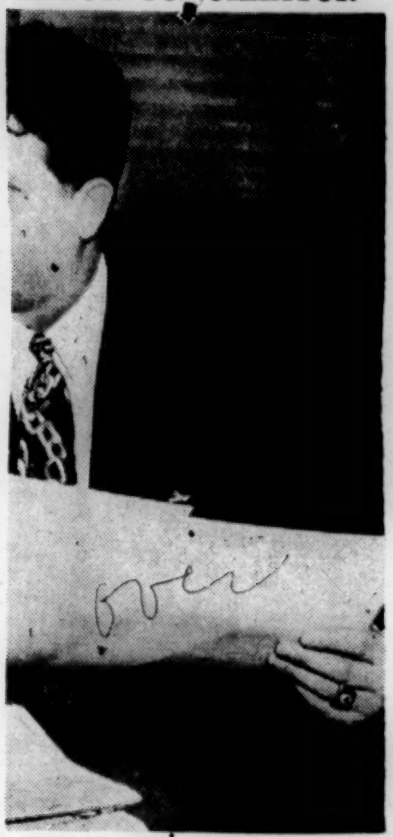
	Total	Women Number	Percent of total
Buffalo	47,000	19,000	40
Rochester	21,000	12,000	57
Utica	6,400	3,700	58
Syracuse	9,600	3,840	40
Albany	16,000	12,000	75
New York City	175,000	116,000	66
Binghamton	15,000	7,500	50

Details are given of the reconversion plans of some individual firms. (N. Y. Industrial Bulletin, October 1945)

NYX

THURSDAY, SEPTEMBER 20, 1945.

LABOR CONCILIATOR



andidate for Mayor of Detroit, talking
er, in an attempt to end the strike at

SCHOOL ENROLLMENT

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BRIDGEPORT BARS JOBS FOR WOMEN

One-Third of Labor Force in War, They Now Appeal to WLB in Boston

From a Staff Correspondent

BRIDGEPORT, Conn., Sept. 19 —Women workers in this city, who constituted almost one-third of the labor force in local plants during the war, were among the first to be laid off immediately after V-J Day and are now being met with answers of "no women being hired" and "we don't want women" when they apply to company employment offices for peacetime jobs.

Twenty-four women picketed one local plant, the Lindstrom Too and Toy Company on Sillima Avenue, yesterday, saying the were laid off when war contra ended but were not called ba when work began again at t plant. They asserted that oth workers—non-union men and w men—have been hired in violati of a closed shop agreement wi the company.

The women have sent three their group members of Local 4 Paper Novelty and Toy Worke Union, to present their case tod to the War Labor Board in Bosto

Denial by Company Head

Frank L. Lindstrom, presider of the company, denied that an closed shop agreement had ev existed and said that most of t work at the plant now is too hea for women.

Of the 15,000 workers discharge from local plants after cancell tion of Government contracts tw thirds were women. This w partly explained by the fact th one plant that discharged ma persons was an aircraft plant e ploying a large number of wo However, the number of wo.len workers in the Bridgeport rea has decreased to 28 to 30 per ent of the entire labor force and it will fall lower, probably to about 25 per cent, or one woman worker to every man.

Despite predictions that women workers would return to the home after the war, women in dungarees, slacks and workdresses make up more than half the long lines in the State Armory Building on Main Street where emergency headquarters have been set up for the State unemployment compensation offices. Most of them reported they considered themselves workers and intend to go on working if they can get jobs.

10,000 Unemployment Claims

in the needle trades for which war workers have had little experience. Other openings were available for sewing machine operators, sales people, clerks and domestic workers.

Mr. Stone said that most of the jobs pay from 60 to 75 cents an hour but that many women had shown reluctance to take jobs that would mean a reduction in take-home earnings since there would be no overtime bonuses.

Predicting that many workers from outside areas would return to their homes and housewives would go back to their kitchens, Mr. Stone said that within sixty to ninety days there will probably be a leveling-off of employment with about 45,000 to 50,000 workers in industry in this area. He predicted also that "unemployment will not be a serious problem around Bridgeport."

Labor union officials and women applying for jobs were not so hopeful.

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10,000 Unemployment Claims

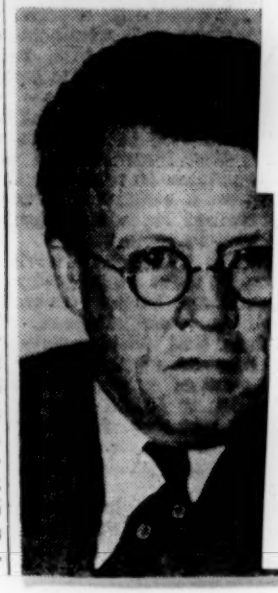
Ten thousand claims for unemployment compensation have been filed in Bridgeport, 50 per cent of these for women, according to Doris F. Hargraves, examiner in charge at the armory. Applicants come in at the rate of about 1,200 a day. The maximum benefits are $22 a week but this will soon be raised $2 for each dependent up to six.

George H. Stone, manager of the United States Employment Office at 1281 Main Street where women are also lining up to apply for jobs, said that there are 2,250 jobs available through his office. These are chiefly for men only, 569 being listed for women.

Most of the jobs for women were

9-20-45

RESIGNS AS OES



NEW CONCILIATOR TACKLES STRIKES

Edgar L. Warren Sends More Men to Detroit—Schwellenbach Sees WLB Members

Special to THE NEW YORK TIMES.

WASHINGTON, Sept. 19—Secretary Schwellenbach began coordinating the work of his enlarged establishment today as his new conciliation director; Edgar L. Warren took the oath of office and tackled the strike situation. The conciliation service sent additional members to Detroit, making a total of twenty there, but Mr. Warren had no plans to go there personally.

Mr. Schwellenbach met with members of the War Labor Board and was understood to have asked them to proceed with their work as usual and assured them that he did not intend to interfere with policy or personnel.

The executive order formally transferring the WLB, the USES, and the Retraining and Reemployment Administration to the Labor Department was signed and issued today. As written, the order provides that the WLB "shall be in all respects subject to and governed by such policies, consistent with law, as the Secretary of Labor shall prescribe."

This caused some concern among WLB members who sought a prompt clarification from the Secretary. Mr. Schwellenbach, it is understood, said that he only wanted to be free to enter a strike situation even after the dispute had been certified to the Board. The practice of certifying cases would continue, it was said, even though the WLB was now a part of the same department as the conciliation service. Heretofore, after a dispute had been certified, it was the practice of the WLB to retain exclusive jurisdiction and conciliation commissioners did not reenter such cases.

Some WLB members, after the conference with Mr. Schwellenbach, questioned what purpose had been served by the transfer and expressed doubt that a policy of non-interference would continue. It was pointed out, however, that by having control of the WLB, Mr. Schwellenbach was free to propose to the forthcoming management-labor conference what should be done with it an dthe nature of a successor agency, if any.

H. J. Brunnier, president of the American Automobile Association, called on President Truman today and gave him a statement dealing with the unrest in the automotive industry. He said that millions of cars had reached such a state of interioration that they constituted a serious safety hazard and that "the only hope lies in new production in as large a volume as possible as quickly as possible."

Mr. Brunnier's statement added that he had just returned from the Detroit area and had "the firm conviction that unless the management-labor controversy was handled firmly and speedily that there was no chance whatever of setting the 500,000 new cars that the public expected this year.

"We are very happy "the statement said," over the action you have taken in designating the newly reorganized Department of Labor to take the issue under its jurisdiction in the interest of a speedy and amicable solution. There is no doubt that the country will endorse this fortheright and logical action."

Excerpts taken from
New York Times
September 12, 1945.

MAYORS OF 9 CITIES OPTIMISTIC ON JOBS

- - - -

Mayor Bernard Samuels of Philadelphia said his City Planning Commission had prepared a comprehensive program for the reconversion and post-war periods and looked "with confidence" toward the future. He pointed out that Philadelphia became a major war production center "without the sensational growth" of some cities. Its hundreds of industries are so diversified that they turned to war work "without the dramatic industrial conversion of many other cities."

"To speed the absorption of 50,000 displaced war workers," he continued, "the city's Committee for Economic Development and cooperating business and industrial firms have taken definite steps not only to speed reconversion but to rehabilitate production equipment and develop sales and distribution facilities.

Mayor Cornelius D. Scully of Pittsburgh, the nation's steel capital, said the area has taken reconversion in stride "with amazingly slight disturbance to our economic life." Only 6,000 workers have been laid off since the Japanese surrender, and about 4,000 have been reemployed.

"None of our major basic industries has been affected by the war's end, which chiefly hit small specialized war plants," he said.

Earlier in the year 20,000 were laid off in the wartime shipbuilding industry, but he said most of these returned to the small towns and farms from which they had come. He expected this industry to provide considerable employment in building and repairing river craft.

A report of the War Manpower Commission as of Sept. 8 showed 10,422 job vacancies in the area.

The Mayor expected big orders for steel and other basic products to be placed by the automobile and other industries, insuring "many good years ahead for Pittsburgh."

He said the immediate outlook is so favorable for Pittsburgh because its basic industries during the war simply continued, at an accelerated pace, making their regular peacetime products, and thus have no great reconversion problems.

Pointing out that Pittsburgh, lacking finished-goods industries, is dependent on such industries in other cities, he said its employment situation would rise or fall in accordance with the rapidity of reconversion in those industries.

Miss Robinson

U. S. Department of Labor
Women's Bureau
Washington

July 7, 1945

From Miss Benham
July 1945, No. 1

EMPLOYMENT OF WOMEN - NOTES FOR USE OF STAFF

Reports on: Recent Material of Interest
Standards for Women's Work
Employment of Women
Training of Women Workers

Great Britain - Pottery

Before the war, of 60,000 workers in the pottery industry, 55 percent were women and girls. The National Society of Pottery Workers has published a plan for reconstruction of the industry, including improvement of standards. In 1938 earnings of skilled craftsmen varied from 1s 2½d to 2s 2d. Although the work done by women is in no way inferior to that done by men, their earnings ranged from half to two-thirds of men's. This is partly accounted for by the fact that women's output is lower; but women's piece work prices were invariably lower than those for men doing the same work.

In the Stoke district, where nearly three-fourths of all workers are employed, there has been since 1932 an average of 50 deaths a year from potting silicosis, with about the same number disabled, while others though suffering from the disease, continue to work. (Labour Research, June 1945)

EMPLOYMENT OF WOMEN

Electrical

Employment at General Motors was 175,290 at the peak, December 1943, according to Charles E. Wilson, president. It had fallen to 153,685 by March 31, 1945. Most of the reduction was due to employees leaving for military service or personal reasons. Only a few actually were laid off for lack of work. Critical labor shortages exist particularly with regard to highly trained engineers, technicians, designers and skilled workmen such as tool makers and all-around mechanics. (N. Y. Times, June 28, 1945)

Missouri - Cutbacks

It is estimated that over 40,000 workers will be laid off in St. Louis before Sept. 1; 16,000 of them at the Ordnance plant where production will stop September 1. In Kansas City 46,000 will be laid off at the Lake City Ordnance.

- Employment

The Signal Corps contract for radios at Aireon Mfg. Co., Kansas City, has been cancelled, but the firm is retooling for a new secret Navy product. It is anticipated that most of the present workers will be placed on civilian production as soon as materials are allotted to them. 2,000 are employed now, 42 percent women. An additional 2,000 will be needed for the Navy product, mostly women. (Report from Miss Wolfe)

New York - Railroads

Only 40 women remain of 70 hired by the Long Island Railroad to work on trains. Women between 21 and 35, more than 5 feet 5 inches tall and weighing at least 120 pounds, will still be hired. Increasingly frequent delays have occurred on trains since June 10 when the expanded summer service went into effect. There are 85 fewer guards, ticket takers and brakemen than are considered essential. (N. Y. Times, June 28, 1945)

TRAINING OF WOMEN WORKERS

Wartime Training

Intensive training of engineers, chemists, physicists and production supervisors under the Engineering, Science and Management War Training Program and training of war production workers, under Vocational Training for War Production Workers program, is to be ended June 30.

Under the second program enrollment from July 1, 1940 through March 31, 1945 was as follows:

	Total	Women	
		Number	Percent of total
Total	7,369,017	1,474,479	20.0
Pre-employment	2,662,558	554,422	20.8
Supplementary	4,706,459	920,057	19.5

(Education for Victory, June 20, 1945)

Woman Apprentice

A jewelry company of Youngstown, O. has indentured a young woman, 19 years old, to the jewelry trade. She is said to be doing very capable work. (Highlights, Apprentice-Training Service, June 23, 1945. Confidential)

Missouri - Cutbacks

The McQuay-Norris Mfg. Co., St. Louis, making bullet cores laid off 250 men and 350 women in late June. (St. Louis Post-Dispatch, June 26, 1945) At Landis Machine Co., morter fuzes, 100 women were to be laid off. (Ibid July 3, 1945)

Pennsylvania

Termination of war contracts and cutbacks have thrown 25,000 out of work in Philadelphia area according to WMC. The area director thinks industry is sufficiently diversified to absorb most of these workers. (Phila. Inquirer, July 6, 1945)

June 30, '45

Cutbacks - General

A study was made by BLS of all plants experiencing war production cutbacks during the period Dec. 1943 through May 1944 for which complete data on labor turnover were available. Employment declined less than 5 percent in this group of plants within the 3-month interval following the cutbacks. The effect on turnover of women in all plants studied was as follows:

	Women as percent of total		
	First Month	Second Month	Third Month
Employment	31.94	31.91	32.6
Separations	41.55	42.51	41.07
Layoffs	39.75	50.78	49.25
Accessions	46.14	49.04	48.43

This does not represent discrimination against women, but is a result of their lesser seniority. The same data is given for each of 14 industry groups. (M. L. R., June 1945)

WMC estimates that there may be 1,300,000 unemployed by December and 1,800,00 by June 1946. Union officials consider these figures gross understatements, but have no other to offer now. They say that unnecessary hardships were being forced on munition workers because there were little if any notice of cutbacks and cancellation of contracts, although the Mobilizer's office required seven days notice. (N. Y. Times, June 29, 1945)

- New York

To man war plants Buffalo increased its work force in manufacturing from 138,000 to 256,000. Only 70,000 workers were brought in from outside the area. Many were persons shifted from trade and service industries. At the peak 51 percent of all employable women between 14 and 65 were working in Buffalo war plants.

Cutbacks - New York (cont.)

The first week in June, 10,000 of the 54,000 aircraft workers had been laid off. These were largely women who are reported to be going back to old trade and service jobs and not to be interested in recruiting drives for war workers in Elmira, Jamestown and Rochester.

Bell Aircraft, employing 34,000 at peak will be down to 6,000 by September, 20,000 reduction by controlled hiring and voluntary quits, 8,000 by direct layoffs. They hope to make helicopters.

General Motors at peak employed 17,000 on aircraft engines, now employs 10,000 but 1,000 are to be released--mostly women because of seniority.

Curtiss-Wright--peak 45,00, now 30,000. Employment has been maintained by shifting production from the St. Louis plant and from subcontractors. They might produce transport planes. A $4,000,000 research laboratory is seeking new fields. (Business Week, June 9, 1945, p.15)

Wac's in Pacific

Lieut. Col. Mary Agnes Brown, staff director of Wac's in the Southwest Pacific, said the force of 5,000 would soon be increased to 7,000. Asked if the climate added to the health hazards for women, she said that a medical study was now being made of the problem. (N. Y. Times, June 23, 1945)

Shipyards

The percent of women wage earners to total employed in shipyards has declined steadily since the peak in April 1944. In April 1945 women were 14.4 percent of all in shipbuilding and 2.7 in repair yards. On the Pacific Coast the proportions were 14.5 on new construction (March) and 0.9 on repair (April). High rates in repair yards were 3.4 on the Gulf Coast and 14.8 in one Atlantic yard. (The Victory Fleet, June 18, 1945)

- Layoffs

425 persons were laid off at the Studebaker plant, Chicago Area, May 11 and 12. 381 of them were interviewed by U.S.E.S. interviewers. 95 women were interviewed but only 7 referred to other jobs at that time. Of 88 women not referred, there were no suitable openings for 30, 15 were not interested in jobs at that time, and 43 were evidently not interested in jobs available because of lower wages. Of 286 men interviewed on these two dates, 115 were referred to jobs. Others may have returned to U.S.E.S. later. (Memo from Miss Ziegler, June 19, 1945)

Ohio

Jack and Heintz Inc., Cleveland, will eventually have to reduce their force of 8,600 "associates". Their plan is first to reduce hours from 60 night shift and 52⅓ day shift, to 48 and then 40. Next they would have mothers and married women with husbands resign. Men and women who "enlisted" for war work should go back voluntarily to their old jobs and professions. They are now considered temporary workers. Layoffs may be postponed by new contracts received just after the first announcement suggesting who should resign. (Business Week, June 9, 1945, p. 84)

Ohio - Cutbacks

There are enough jobs in the Youngstown area to take care of the thousands of men recently laid off because of cutbacks, but there is a surplus of women workers. Perhaps some of these could qualify for Pacific Coast jobs in repairing war ships. For the first time in many months U.S.E.S. is getting applications from women willing to do housework. (Editorial, Youngstown Vindicator, June 3, 1945)

- Rubber

The first major cutback on a military contract in Akron announced June 13th, involved reduced production for bullet-sealing fuel cells at B.F. Goodrich plants. The men affected will be provided with other jobs. It is indicated that after all possible transfers to other war work has been made there will be a surplus of 250 women.

800 workers were notified of release at a Ravenna ordnance center, June 13. WMC staff members were sent immediately to recruit these workers as there are 1500 unfilled priority jobs in the Akron area.

Ohio - Rubber (cont.)

War requirements have expanded the rubber industry from 48,600 on July 1, 1941 to 68,128 as of the present time. WMC representatives said there will be jobs after the war for all native workers now employed. "We naturally expect that a large percentage of the migrant workers will return to their homes." (N.Y. Times, June 14, 1945)

Pennsylvania - Shipbuilding

At Dravo, Pittsburgh the end of the LST-building program released thousands of workers. Five out of six women asked U.S.E.S. to place them immediately in another essential industry. (Pittsburgh Press, May 27, 1945)

EMPLOYMENT

Cut-backs of Women Since VJ Day

USES has noted the rate at which women have been laid off in the month ending September 15 compared with men in a number of industries and areas.

I. By Industry

Aircraft Not in significantly greater proportion than men. For example, in airframe plants women were 36 percent of V Day employment and 37 percent of workers laid off since.

Communications equipment Women were less than 60 percent of total employed, but two thirds of all displaced workers.

Machinery, Electrical Women were 40 percent of employed on July 15, 60 percent of released workers.

Other. Women were 25 percent of those employed on July 15 and 40 percent of those released by Sept. 15.

Ordnance Decline in employment since July 15 was 64 percent for women and 40 percent for men. The proportion of women has dropped from 33 to 23 percent.

Steel Between August 15 and September 15 total employment dropped 2 percent; women's employment, 10 percent. Several firms report that women will be replaced by returning veterans.

II. By Areas

Declines noted are in metal-chemical-rubber industries between Aug. 15 and Sept. 15.

New York decline - 121,000. Ratio of women to total increased from 32 to 45 percent.

Chicago 80,000 - half women

Los Angeles 85,000. Ratio of women to total fell from 28 to 24 percent.

Detroit 27,800, 40 percent women. About 57 percent of initial claims for unemployment compensation in first two weeks were filed by women.

San Francisco Bay 79,000 proportionately greater for women.

St. Louis 60,000 greater for women.

Cleveland 60,000. Ratio of women fell from 29.5 to 24 percent.

Textiles

W.P.B. says that to meet textile production goals, 150,000 more workers are needed, 50,000 immediately. Military requirements for cotton goods for the third quarter of 1945 are at new record highs. (Textile Labor, July 1945)

Alabama - Textile Products

A factory is being built in Bessemer City to employ 250 full-time workers to make chenille bedspreads, bath robes, mats and rugs. A laundry is being erected also. (Textile Bul., July 1, 1945)

California - Working Mothers

In mid-June enrollment in nursery schools and extended day care centers in Los Angeles county was higher than ever before totaling 11,400 children. Enrollment is 86 percent above a year ago. (Los Angeles Times, June 15, 1945)

- Manufacturing

Employment of women in factories is at the lowest level since December 1942. Employment in May 1945 compared with May 1944 was as follows:

	Number		Percent of Total	
	1945	1944	1945	1944
All Manufacturing	187,800	238,400	28.0	28.7
Durable goods	114,700	165,400	23.8	25.6
Aircraft	56,200	83,700	39.8	42.0
Shipbuilding	16,100	37,300	10.3	1/ 15.5
Nondurable goods	73,100	73,000	38.9	39.6

(Emp. of Women in Calif., May 1945, Dept. of Ind. Relations Release)
1/ August.

Cut-backs of Women since VJ Day (cont.)

Minneapolis - St. Paul 25,000. Women's rate of decline 35 percent greater than total rate. (Total decline 37 percent. Women's decline 50 percent.)

Milwaukee 17,700. Women's rate of decline 20 percent greater than total rate (Total rate 13 percent, women's 15.6 percent.)

Akron 19,500. Ratio of women to total fell from 29 to 24 percent.

New Orleans 13,300. Ratio of women to total dropped 5 percent.

Dallas 10,500. Ratio of women to total fell from 27 to 21 percent.

(The Labor Market, USES, October 1945.)

Cutbacks

More than 1,000,000 persons have been released because of war contract terminations, according to a survey made by the Associated Press, and many of those now unemployed seemed in no great hurry to secure other employment. Among the reasons cited for this lag, are: unwillingness to accept lower wages, the retirement of many women and aged men from the labor market, and war workers were taking needed vacations or waiting for jobs in reconverted industries.

It was noted that opportunity for employment exists in food and general merchandise stores, as well as in service establishments.

Some of the major cut-backs were in the following areas:

Chicago	85,000	Pennsylvania	140,000
Connecticut	56,000	Indiana	123,600
Michigan	150,000	Los Angeles	47,000
"	(40,300 more, soon)	New England	125,000
Baltimore	32,000	New Jersey	90,000

(N. Y. Times, Aug. 23, 1945)

Economic Controls - England

A bill has been presented to Parliament to continue for 5 years certain wartime controls over prices, production and distribution. The bill is de igned to maintain fair prices over the supply and distribution of essential supplies and services.

Within the next two months 1,500,000 British workers will be released from war production. Demobilization from the armed forces is expected to add 900,000 men and 100,000 women to the labor force by the end of the year. Class B of the program provides for the speedy release of men to enter the housing program, coal mining and teaching. It is also being enlarged to include women willing to return to such civilian industries as textiles, clothing, boots and shoes and laundries, where experienced workers are urgently needed.
(N. Y. Times, Aug. 24, 1945)

Filed

WOMEN'S BUREAU
JUN 21 1945
DEPARTMENT OF LABOR

Miss Frieda Miller, Director

June 19, 1945

Martha Ziegler

Chicago Area Labor Supply
and Cut-Backs

Attention Miss Manning, Miss Robinson, Miss Pidgeon

Attached are some miscellaneous clippings dealing mainly with labor supply and cut-backs in the Chicago area. Some of these clippings are quite old and may not be very useful. I was particularly interested in the clippings which announced the relaxation of controls over the woman labor supply in Chicago. Also I was interested in the lead sentence in the Chicago Times story of June 18th. However, the companies listed in this story still seem to have a demand for over 1900 women. A few months ago I sent another list of this type to the office, indicating that the Douglas Aircraft in addition to specific requests for men and women, had a demand for over 1000 workers who could be either men or women. I note that this demand has now shifted to 1089 men and 374 women.

Incidentally, when I returned to Chicago I found a few figures which Mr. Shoneberger of the Chicago W.M.C. had given me with respect to the Studebaker plant. He said that on May 11th and 12th interviewers from USES talked with 381 of 425 persons laid off at Studebaker those dates. Ninety-five women were interviewed but only seven of them were referred to other jobs at that time. Of the 88 women not referred, there were no suitable openings for thirty; 15 stated they were not interested in a job at that time, and 43 were evidently not interested in the jobs available because of lower wage rates. Mr. Shoneberger indicated that it will be difficult for women to get other jobs at the rates paid at Studebaker.

Of the 286 men interviewed during these two dates, 115 were referred to other jobs. However, Mr. Shoneberger stressed that these figures concerning referrals may not mean very much, since some of the workers who did not immediately take the jobs offered may have come to a local USES office later and accepted a job.

Miss Robinson

U. S. Department of Labor
WOMEN'S BUREAU
Washington

June 9, 1945

From--Miss Benham
June 1945, No. 1

EMPLOYMENT OF WOMEN - NOTES FOR USE OF STAFF

Reports on: Recent Material of Interest
Standards for Women's Work
Employment of Women
Postwar Problems

RECENT MATERIAL OF INTEREST

In Women's Bureau

Characteristics of Unemployment Compensation Claimants in Seven Labor-shortage Areas (March) in The Labor Market, May 1945.

The majority were women, or men over 55 years of age. The proportion of women ranged from 28 to 87 percent. More women were classified as semi-skilled than in any other category, but there were high proportions of white-collar workers. Lower wages was the only detrimental reason for nonreferral of women in one area, and a significant reason in two others.

In Labor Library

E.A.W. (Electrical Association for Women) Point of View on Postwar Reconstruction. Great Britain

Outlines for study in three sections.

I. Education and Careers.
(includes careers for Women in the Electrical World)

II. Housing and kitchen planning

III. Electricity in the home and the design and performance of electrical apparatus and appliances.

Getting Rid of the Women. Can war wives hold their jobs? by A. G. Mezerik, in the Atlantic, June 1945.

The National Sex Ratio and the Problems of Reconversion, by Chester Alexander, in School and Society, June 2, 1945.

"When we speak of reconversion, do we have in mind that the women of the land will be as vitally concerned as the men?"

Will the Women Go Back to the Kitchen, in Industrial Relations, May 1945.

Reviews a number of recent surveys.

U.S.E.S. interviewers at Willow Run indicated that about half the women being laid off do not want anymore war work (Hence half do?). They want to get back to household tasks. In the first week of layoffs, more than 60 percent were women, in the second week, 42 percent.

A recent study made by Bryn Mawr indicates that "the basic pattern that has been developing for the past generation indicates that as many women will be working in 1950 as are now employed in the war effort. Actually, one out of every three- - -will continue to work in an economy of full employment."

STANDARDS FOR WOMEN'S WORK

California - Conditions in Stores

The weight lifting problem resulting from use of women in order filling departments of several chain stores has been solved by use of small trucks and electric trains.

Fitting and workroom lighting in apparel stores is poor as a rule and many eye strain complaints are submitted.

Large department stores report that increased efficiency has resulted from regular rest periods, and express appreciation that 10-minute periods are required for women who stand at work.

Some chain groceries have indicated that as a whole, they find women more satisfactory than men as clerks in vegetable departments and as checkers. Two large chains have made tentative postwar building plans that include full sanitary facilities for women employees. (Report to Governor's Council, May 1945)

Michigan - Aid to Dependents

The State Unemployment Compensation Act was amended to provide $2 a week for each dependent child up to a total of $8, or a total maximum of $28 instead of $20. (Consumer's League of Michigan Bulletin, May 16, 1945)

New York - Minimum for Stores

The first Retail Trade Minimum Wage Board in New York was convened June 5, 1945. It is estimated that about 275,000 women and minors and 155,000 adult men will be effected by the actions of the board.

A recent study by the New York Department of Labor showed that over 40 percent of the women and minors earned less than 50 cents an hour, and 20 percent, less than 40 cents. (Release of N.Y. State Dept. of Labor, June 5, 1945)

EMPLOYMENT OF WOMEN

Connecticut - Married Women

The Hartford board of education has voted five to two to remove the ban on married women teachers because of the scarcity of teachers. It is suggested that this action may not be permanent--for economic rather than educational reasons. (Editorial, Hartford Times, May 19, 1945)

Indiana

U.S.E.S. has stated that at least 2,000 more women are needed in Indianapolis war industries. (Indianapolis Star, May 27, 1945)

Rhode Island

Goodyear Fabric Corp., Woonsocket, wants to recruit 250 women to assemble heavy pontoons for the Pacific Area. (Woonsocket Call, May 16, 1945)

Michigan - Cut-backs

The Ford Motor Co., has been notified of termination of its Army jeep contract by July 31. Curtailment will affect 1,500 workers at the Rouge plant and about 700 in three assembly plants.

Additional cutbacks in contracts of General Motors, Flint will increase to more than 9,000 the number of employees affected.

Cancellation of contract for machine guns at AC Spark Plug will affect about 3,000 workers. (Mich. Mfgr. and Financial Record, May 19, 1945)

R. I. Thomas, president, UAW-CIO has written Henry Kaiser asking him to "give serious consideration to the proposal" that he take over Willow Run, perhaps to build automobiles, as it would be a great loss to nation if the plant were to lie idle. (Detroit Times, May 15, 1945)

POSTWAR PROBLEMS

Status of Women

The writing of the Charter of the Economic and Social Council of the world organization has been completed. Chapter IX specifically provides for a commission on human rights. The committee drafting the charter has backed a Brazilian suggestion that there be a commission of women to study the economic and social status of women. (N. Y. Times, June 8, 1945)

Shoe Industry

Representatives of fourteen associations in the shoe field will meet June 7th to form a committee to guide operations of the "fifty-two-week plan" recently advocated by the National Association of Shoe Manufacturers. The program aims at steadier employment, reduction of production and selling costs and higher quality. (N. Y. Times, June 4, 1945)

Rights of Women

The officers of the National Women's Trade Union League met May 10-11 to formulate a program for securing the Basic Rights of Working Woman. These rights include the Right to Work, Equal pay, Equal seniority and Legal safeguards. (Life and Labor, June 1945)

Massachusetts

A survey by the National Manufacturers' Association indicates that Massachusetts manufacturing industries will employ about 29 percent more workers after the war than before--an increase of 160,000 jobs. Only 3 percent of the factories in the State will have fewer jobs; 16 percent, about the same number; and 81 percent, more jobs. More than half (58 percent) will not require any time for reconversion after war contracts end; 32 percent will need up to four weeks; 7 percent, six or eight weeks. This will mean about 19,000 workers will be out of work more than four weeks. (Industry, May 1945)

Minnesota

The Industrial Committee of the YWCA will begin a survey in Minneapolis May 14. They will interview managers and women in 36 representative plants now using women in industrial jobs. Points to be covered are present and estimated postwar status of the woman labor force, types of employment most suitable for women, whether or not women will be able to use their present skills in postwar industry, and so on. (Duluth Labor World, May 10, 1945)

Nebraska

A Veterans of Foreign Wars post in Omaha has launched a movement to obtain pledges from all married women in "men's jobs" that they will stop work when the war ends. (Denver Post, May 27, 1945)

Excerpt from Maritime News Digest
May 23, 1945

BAY YARDS DROP 3,400 WOMEN — EXAMINER, San Francisco, Cal.

Cutback in women shipyard workers attained a record reduction of 3,400 during March, John F. Dalton, labor statistics division chief, announced yesterday. Employment of women in yards other than government yards sank to 23,300, placing lay-offs of women wage earners at a faster rate than men. In the Bay area, the reduction of 3,100 women in the industry was nearly twice the previous maximum decrease of 1,600. The female wage earner level in Bay shipyards for March was 11,700, 42 percent below a year ago. Male production employment was down 22 percent. All manufacturing industries in the Bay area employed 46,700 women wage earners in March. 3,700 less than the previous month and 21 percent below a year ago. Male workers had decreased 17 percent from a year ago.

Extracts from article in "American Labor Citizen" of May 14, 1945

EMPLOYMENT FOR WOMEN SLIDING DOWN THE SKIDS IN CALIFORNIA FACTORIES
As Usual San Francisco Tops L.A. in all Layoffs in All Industries

San Francisco--California shipyards (excluding government yards) employed 23,300 women wage earners in March, down 3,400 from February announced John F. Dalton, chief of the Division of Labor Statistics and law enforcement, last week.

This reduction was considerably larger than the maximum monthly contraction of 2,500 in the female factory force previously reported in the industry. Women wage earners are being laid off by shipyards at a faster rate than men. Current female production employment is 13,900, or 37 percent, below the year-ago level of 37,200. The number of male wage earners in the industry decreased to 167,700 in March, down 57,300, or 25 per cent from March 1944.

The number of women factory workers in airplane plants declined to 64,700 this March, a loss of 1,000 from February. In the aircraft industry, as well as in shipbuilding, employment of female production workers is decreasing more rapidly than the male factory force. The number of female wage earners in airplane plants this March was 23,000 or 26 per cent, below a year ago. The male factory force in March was 29,600, or 24 per cent, below March 1944.

The number of women wage earners in all durable goods industries combined decreased to 130,400 this March, a loss of 3,800 from February. The female factory force in these industries in March was 37,800, or 22 per cent, below the March 1944 level. The number of male production workers in the durable goods group decreased to 407,300 in March, down 95,400, or 19 per cent, from a year ago.....

Shipyards (excluding Government yards) in the San Francisco Bay Industrial Area (Alameda, Contra Costa, Marin, San Francisco, and San Mateo counties) employed 16,100 women wage earners in March, down 3,100 from February. This February-March loss was the largest month-to-month decline reported in the industry since September 1944, and was nearly twice the previously reported maximum decrease of 1,600. Women production workers are being laid off in the area shipyards much more rapidly than men. The female wage-earner level this March was 11,700, or 42 per cent, below a year ago. Male production employment was 103,400 in March, down 36,500 or 26 per cent, from March 1944.....

Shipyards (excluding Government yards) in the Los Angeles area employed 6,800 women wage earners in March, a loss of 500 from February. The current number of female industrial workers is 1,900 or 22 per cent, below March 1944. Male wage earners were laid off at the same rate, decreasing to 58,900 this March from 75,100 a year ago.



Miss Manning's report 2/27/45

In my memo to the ~~fiimx~~ field of February 1 mention was made of Mrs. Currier's report of the unemployment situation arising from the closing down of the Portland yard. We have since been informed that there have been layoffs also in some of the South Atlantic yards and more recently in one of the Kaiser yards at Vancouver, Washington. In the latter place many women who were ~~xxx~~ journeymen electricians were affected.

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Mrs. Lowrie reported a layoff of four thousand women by the Buick and Chevrolet plants in Flint and when the women refused jobs at the AC Spark Plug for 85 cents an hour, i. e., 25 cents less than the Buick plant, they were granted unemployment compensation.

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In a recent trip to Kansas City, Miss Wolfe learned that the North American Company has had a drastic reduction in its contract for B-25 planes as a result of which many are being laid off. The week previous to her visit 800 were laid off, probably the larger part of them being women. Before the plant can change over and complete its retooling for a new type of plane, weeks and months must elapse and in the meantime the force will undoubtedly be reduced by one-third. In contract to the situation at the North American, both Pratt-Whitney and Remington Arms are increasing employment in this area.

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Schroeder - WMC 3406-7 PM-4704

Important

WAR MANPOWER COMMISSION

For Immediate Release
Wednesday, November 1, 1944

Cleared and Issued
Through Facilities of the
Office of War Information

There is a critical shortage of women workers in the 12 major plants producing radar tubes, the War Manpower Commission said today.

WMC officials said they had been informed by the War Production Board that tubes were the "bottleneck" in the lagging radar program. A need for additional workers has been developing for months, but did not become acute until September, when the 12 plants reported 2,100 separations, chiefly women. The percentage of women in the plants is from 75 to 80 per cent. The work is comparatively light and working conditions are excellent, two factors that have served to attract women, WMC said. The plants made only minor restrictions as to age and physical abilities to encourage the employment of women.

Recently, however, women have been leaving in increasing numbers. The majority, in giving their reason for leaving, say they have home duties or merely that they are tired of working, WMC said. Battle successes have made them over-optimistic, WMC said.

Radar is on the production urgency List, the agency pointed out, and it is vital to victory. The services of these women are still desperately needed, WMC said. The loss of women workers has been made doubly serious by the additional loss in September of students and teachers returning to school.

Total employment in the 12 plants on October 1 was 25,600 and of these 20,100 were women. WMC officials said that an additional 3,300 workers must be found by December 1 if radar production is to be brought up to schedule.

The plants are situated in New Jersey, Kentucky, Massachusetts and Pennsylvania, but not all are in tight labor areas. Inter-regional recruitment is not entirely practical since the need is for women. As a rule, women do not always find it possible to leave their home areas.

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X-35488

U. S. Department of Labor
WOMEN'S BUREAU
Washington

February 11, 1946

From - Miss Benham
February 1946, No. 2

EMPLOYMENT OF WOMEN - NOTES FOR USE OF STAFF

Reports on: Recent Publications
Standards for Women's Work
Employment of Women
Other Items of Interest

Notice: The function of these "Notes" is to keep the staff informed on what of interest is currently appearing in publications to which the Bureau has access.

Certain items are marked with a triple star: ***. This means that these items have been double-checked. They may therefore be quoted with the source as authority.

In making use of thise items, however, THE VALUE OF THE SOURCE MUST BE WEIGHED. For example, statements of an agency itself have greater value than quotations of that agency's statements by another, say a newspaper. Again, one agency's statements have less value as against another agency's, say the statements of an agency with an axe to grind vs. those of a government agency.

Items not starred MUST NOT BE QUOTED. They are intended only as indicators and guides for further reading or investigation.

RECENT PUBLICATIONS

In Women's Bureau

Which Road, Women Workers. "You can't have your cake and eat it too" -- equal pay and special protective laws. By Alma Lutz, in Christian Science Monitor, February 2, 1946.

Facing Forward to Peace: Recommendations of the Social Security Board in its Tenth Annual Report in Social Security Bulletin, December 1945.

STANDARDS FOR WOMEN'S WORK

***Hosiery Workers - Earnings

Earnings of 11,022 full-fashioned hosiery workers in 48 union mills were studied in the early part of 1943 by the American Federation of Hosiery Workers (C.I.O.) in cooperation with employers. Similar studies had been made in 1939 and 1941. Average full-time weekly earnings of all workers in certain occupations employing chiefly women, were as follows:

	1939	1941	1943
Topping	$22.32	$22.74	$31.29
Looping	22.04	23.60	28.32
Gray (undyed) mending	21.56	22.92	30.56
Gray (undyed) examining	18.68	20.24	25.84
Finished mending	22.56	23.60	30.60
Pairing	20.72	23.32	29.48
Folding	18.96	20.76	27.28

(Earnings of Full-Fashioned Hosiery Workers in Union Mills, 1943. Office of the Impartial Chairman, Full-Fashioned Hosiery Industry, in Co-operation with American Federation of Hosiery Workers and Full-Fashioned Hosiery Manufacturers of America, Inc., pp. I, VII.)

***Wage Raises - Woolen Goods

Some 50 more Rhode Island woolen and worsted mills are advancing wages to meet the 15-cent raise recently granted by the American Woolen Co. In most mills, wages had recently been raised, and the additional increases brought the total to the 15 cents demanded by the CIO textile union, or to more.

About 35 plants recognize the Industrial Trades Union of Woonsocket, while most other mills are unorganized. About 10,000 workers are affected. (Daily News Record, Jan. 25, 1946, p. 3.)

***Wage Raises - Cotton and Rayon

The New England Wage Stabilization Board has approved a voluntary agreement providing a 65-cent per hour minimum and a general increase of 8 cents with other wage adjustments. More than 20,000 workers are affected in 34 cotton and rayon mills in Maine, New Hampshire, Massachusetts, and Rhode Island. A similar agreement had previously been approved for 19,000 workers in Fall River and New Bedford. (Daily News Record, Jan. 26, 1946, pp. 1, 7.)

***Pennsylvania - Windowless Work Room

The Chipman Knitting Mills, Easton, is reconverting all its knitting rooms into air-conditioned units with fluorescent lighting. All glass windows are to be replaced by brick walls. A grease-resistant asphalt tiling is being installed between all machines and the knitting rooms painted pastel green and biege to lessen eye strain. The company now employs 400, and when a new addition has been built, will employ 200 more. (Daily News Record, Feb. 1, 1946, p. 7.)

EMPLOYMENT OF WOMEN

Although the latest estimate of the total number of unemployed women in the United States in only 470,000, according to the Bureau of the Census, Monthly Report on the Labor Force, January 24:

***Men Are Replacing Women

The U.S.E.S. reporting on employment opportunities in December, indicated considerable displacement of women by men in a number of industries and areas.

In vacuum cleaner plants hiring will be confined to men. In addition to the need for 700 more workers, there will be some 900 openings for men to replace women.

In meat packing and rubber tires and tubes, many employers indicate a desire to replace women with men.

Non-veterans, chiefly women, were being displaced by veterans in Hartford, Gary, Boston, St. Louis, Newark, Cincinnati, Pittsburgh, and Hampton Roads. In the Buffalo-Niagara area, replacement of women by men was marked.

Employers' specifications with respect to the sex of the worker are becoming more rigid in Louisville, Baltimore, Detroit, Akron, and Youngstown-Warren-Sharon. A rise in the proportion of women claimants for unemployment compensation in Milwaukee, from 50 percent to 70 percent, indicates employer preference for male workers.

***Men Are Replacing Women (cont.)

A unique report came from Providence: "As the problem of recruiting women workers becomes more difficult, it is likely that employers will hire men for work in local textile, jewelry, and the electrical machinery industries, in occupations traditionally held by females." (U. S. Dept. of Labor, U.S.E.S., The Labor Market, January 1946, pp. 8,13,15,19-27.)

Michigan - Manufacturing

Women were 27 percent of all workers in Michigan manufacturing industries in October 1945, compared with 23 percent in March 1945, according to State official reports. A relative loss in durable goods industries had been more than made up by the gain in non-durable goods employment. However, numbers employed are not reported. Average hours worked, as well as average hourly earnings, had declined for women in durable goods industries:

	March 1945	October 1945
Percent women were of total employed		
Durable goods	22	17
Non-durable goods	32	37
Average hours worked per week by women		
Durable goods	44	39
Non-durable goods	42	39
Average hourly earnings of women		
Durable goods	$1.12	$ .95
Non-durable goods	.78	.81

(Michigan Labor and Industry, June 1945 and January 1946.)

***Great Britain

About 4¼ million women (14 and under 60 years of age) were reported employed in covered employment in October 1945, compared with more than 3-2/3 million in mid-1939. The figures include only persons insured under the Unemployment Insurance Acts, together with women in part-time employment, 2 of whom have been counted as one.

	Number of women	Percent women were of total insured persons 1/
Mid-1939	3,718,800	29 9
Mid-1945	4,526,400	41.1
September 1945	4,335,600	40.2
October 1945	4,256,900	39.7

1/ The total includes males 14 but under 65 years of age.

***Great Britain (cont.)

The total number of insured persons registered as unemployed November 12, 1945 was 290,766, of whom 121,609 r 41.8 percent were women and girls. (Ministry of Labor Gazette, December 1945, pp. 226 and 228.)

In September 1945, the total female working population, 14 but under 60 years old, exclusive of private domestic service but including some who were uninsured, numbered 6,506,000. The forecast for December 31, 1945, was 5,850,000 women. (Ibid., November 1945, p. 199.)

Ethiopia - Spinning

A spinning center for cotton and wool has been opened in Addis Ababa, giving employment to 3,000 women. (Report of American Minister, Addis Ababa, Oct. 30, 1945.)

OTHER ITEMS OF INTEREST

***Great Britain - Population

With a view to bringing about a more balanced population through a more even distribution of industry, the British Board of Trade has announced a plan to attract into predominantly male areas light industries, such as plastics and clothing factories, which will employ surplus female labor, and thus check the movement of young women to other areas in order to secure work.

Into the textile areas, which employ women largely, the aim is to bring in industry which will keep the young men in the district.

For 20 years experts have watched the drift of young women from the mining regions to seek work in textiles or other light industries, while there has been a steady flow of young men into new coal and industrial belts. The results have been fewer children and more spinsters and bachelors, a bigger percent of elderly people in the textile and similar areas, and a younger population in the newer industrial areas. (N.Y. Times, Feb. 5, 1946.)

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Rec'd 10/5/43
November 15, 1943

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

SUMMARY OF STATE LABOR LEGISLATION FOR WOMEN, 1942 AND 1943

In the war years of 1942 and 1943, 29 States and the District of Columbia enacted legislation governing hours or working conditions of women. Four of these States passed laws on subjects for which no previous legal standards had existed in the State: Rhode Island adopted a meal-period law; Nevada ~~adopted~~ a day-of-rest law; Washington and Illinois ~~adopted~~ "equal-pay" laws. In all States ~~except~~ but these four the war legislation dealt exclusively with existing standards, either modifying them directly or delegating authority to do so.

Legislative changes of a permanent nature.

Delaware amended its night-work law to permit employment of females through ~~11:00~~ p.m. instead of ~~10:00~~ p.m. as formerly. Louisiana shortened the lunch period required by law from ~~one hour~~ 45 minutes to 30 minutes. ~~However,~~ only one State, Arkansas, made a permanent general revision of basic-hour or working-conditions standards established by law. In this State the former 9-hour day and 6-day and 54-hour-week law for women was amended to provide for a basic 8-hour day and 6-day week with overtime at time and one-half, and to require the employer to secure a permit from the commissioner of labor for any overtime of a permanent nature in excess of one hour a day. It also authorizes the commissioner to grant emergency permits to employ women 7 days a week during a maximum 90-day period upon payment of such overtime for the seventh day. In other words, there is now no maximum limit on the daily or weekly working

The Connecticut law governing the hours of women's employment in mercantile establishments was amended to permit the employment of women for 10 hours a day and 57 hours a week for 4 weeks in the year where the commissioner of labor finds an emergency exists.

Labor and Factory Inspection

hours for women in Arkansas. Women may be employed as long as the employer wishes if he is willing to pay time and one-half and secures a permit from the Commissioner of Labor.

Two other States enacted permanent provisions relating to overtime. An amendment to the Vermont laws provides for overtime permits. In Montana the hour law for public service, mines, etc., was amended to permit overtime in emergency.

Five States also made permanent changes in coverage, either as to industries or class of employees covered by basic-hour standards. Thus in the Connecticut 8-hour, 48-hour-and-6-day week law, women in executive, managerial, or supervisory positions earning not less than $175 a month were permanently excluded from coverage. In Louisiana, coverage of the existing hour law was extended to women employed in theatres and as elevator operators, but was withdrawn from women processing sugar cane and sorghum, and from women office workers in certain industries. In New Hampshire, women canning perishable fruits and vegetables were permanently excluded from coverage of the 10½-hour law. In New York the 8-40-hour law for women bindery workers was repealed and women employed in book or pamphlet binderies were permanently exempted from the night-work law.

Change in standards was made in only one State minimum-wage law. In South Dakota, where minimum wages for women are established by statute, the wage was increased from $12 to $15 for cities of 2,500 or more population.

Legislative changes in existing standards of a temporary nature.

Other legislation not only did not make any permanent change in basic hour standards, but in most of the laws even the temporary modifications permitted during the war period are of a restricted, rather than a general, nature.

Moreover, most of the temporary legislation does not change the standards themselves, but instead merely authorizes the governor or the labor commissioner to grant permits in individual cases. Laws that do not in themselves permit relaxations in hours of work or coverage but empower the governor or State labor commissioner to do so were passed in 1942 and 1943 by 14 States and the District of Columbia. The States are: California, Connecticut, Illinois, Louisiana, Massachusetts, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Texas, Virginia. In 9 States relaxations in working-hour standards are authorized by the law itself and no permit is necessary: Delaware, Indiana, Kentucky, Louisiana, Maine, Nevada, North Dakota, Ohio, Texas. However, in 3 of these 9 States the relaxations are limited in coverage - in Kentucky the law applies only to public employment (road work), and the hour standards for private employment remain unchanged; in Nevada, common carriers and communications are exempted for the duration; and in Texas, office workers covered by specific Federal laws are exempted for the duration.

Two States amended existing laws to permit for the duration the employment of women in occupations formerly prohibited. In Utah women may now be employed in smelters and at mines, except in underground work. In Ohio the ban was raised on the employment of women as crossing watchmen, section hands, express drivers, taxi and jitney drivers, gas or electric meter readers, ticket sellers between the hours of 6 a.m. and 10 p.m., as workers in blast furnaces, smelters, shoe-shining parlors, bowling alleys, in delivery service on wagons or automobiles, in operating freight or baggage elevators, in baggage handling, freight handling, and trucking of any

kind. The ~~amount which~~ weight that women may be permitted to lift in the course of their employment was raised from 25 to 35 pounds in Ohio.

The recently enacted laws of California and Ohio present marked differences from other recently ~~enacted~~ hour legislation. Although the emergency legislation in both of these States requires the employer to notify the State labor department, it is not necessary for him to do so until after he has employed women under conditions other than those prescribed by law. In California, the employer has 24 hours in which to request an exemption from the State labor department, which request must then be referred to the Governor and acted on by ~~the latter~~ him. The California law makes no blanket change in the basic-hour standards in the existing law. In Ohio, the basic workday and workweek ~~is~~ are changed from 8 hours a day and 45 or 48 hours a week to 10 hours a day and 50 hours a week. In addition, the employer has 48 hours in which to notify the State labor department of his employment of women for hours in excess of 10 and 50. The employer is not required to obtain a permit but instead the burden is on the State labor department to establish that such employment is unnecessary or is injurious to the women affected. Where it is found to be injurious, responsibility for reducing the hours lies in the department of health.

Effect of new legislation on basic-hour standards.

The extent to which basic-hour standards covering women in private employment are changed or modified by recent wartime hour legislation - either directly or through authorization of the permit system - may be summarized as follows: Maximum daily and/or weekly hour laws were modified in ~~19~~ 20 States

(Arkansas, California, Connecticut, Illinois, Louisiana, Maine, Massachusetts, Nevada, Montana, New Hampshire, New York, North Carolina, North Dakota, Ohio, Pennsylvania, Tennessee, Texas, Vermont, Virginia, Wyoming) and the District of Columbia. Day-of-rest laws were the subject of legislation in 13 States (Arkansas, California, Connecticut, Illinois, Louisiana, Massachusetts, New Hampshire, New York, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, and Nevada, the last-named being the latter sets a standard where none existed before). Night-work laws were modified in 8 States (California, Connecticut, Delaware, Indiana, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania). Laws involving meal and rest periods were enacted in 11 States (Arkansas, California, Louisiana, Maine, Massachusetts, New Jersey, New York, North Carolina, Ohio, Pennsylvania, and Rhode Island).

Labor Laws Advocated by WB.
(Gov Nov 18, N.Y. meeting of
AFL & CIO women) (Mimeog)
11/17/42

disease sustained while in
performance of duty -- (for example,
workers in arsenals, ad quarter-
masters depots, and other workers
within the jurisdiction of the
Federal Government.)

LABOR LAWS FOR WOMEN
ADVOCATED BY
WOMEN'S BUREAU, U. S. DEPARTMENT OF LABOR

VICTORY in the war depends both on men on the battle fronts and workers on the labor fronts. Women are an important part of our labor force at all times and an even more vital part during a war when large numbers of men must be inducted into military service.

LEGAL STANDARDS to conserve and safeguard our human resources are always essential, and doubly so now during our grave emergency. We must maintain our defenses and extend our legal bulwarks to guarantee on all labor fronts protection against the foes of fatigue, illness, accidents -- against the hazards of unemployment and old age. Legal safeguards prevent labor wastage in a period of labor shortage.

WOMEN WORKERS derive benefit from labor laws applying alike to men and women. But additional legal safeguards may be necessary to protect the interests of women -- the homemakers and mothers of the race. Many women are at work in States lacking certain types of legal standards. Other women are employed in occupational fields -- notably household employment and farm work -- exempted from labor laws. Thus in the legal defenses for women workers in this country, there are serious breaches -- some calling for State, others for Federal, action. A comparison of 13 types of necessary labor laws with existing legislation follows:

1. THE 8-HOUR DAY AND 48-HOUR WEEK -- as a ceiling to women's work hours should be set by law in each State. Then only will all industrial women be safeguarded against the bad effects of unduly long hours. In times of peace shorter hour standards may be feasible. Experience proves that when women must work under pressure over a long period of hours not exceeding 48 a week mean better workers and higher output.

Legal hour standards should not be wiped out or undermined in the present emergency. To guard against such danger and to allow any necessary leeway in a grave crisis -- most States have provided for such an emergency through a clause in the regular law, or other action. Thus where an employer can prove his need to employ women longer than the legal limit for a limited time to meet war production schedules he may do so temporarily if granted a certificate by a State authority.

The Federal Fair Labor Standards Act (applying to workers in inter-State industries -- those doing business across State lines) requires workers -- men and women - to be paid a time and half overtime rate for each hour in excess of 40, and thus serves as a brake on long hours. The Public Contracts Act, applying to establishments awarded Federal Government contracts of over $10,000, has a similar regulation. From the viewpoint of women workers this act is at present exceedingly important because of the large and growing numbers of women in the many plants with contracts for war materials.

The 8-hour day with a 48-hour week (or less) is the legal maximum for women in some types of employment in 18 States, the District of Columbia, and Puerto Rico.

2. ONE DAY OF REST IN SEVEN -- as a legal requirement should be universal for workers. Such a weekly rest pays dividents to both workers and employers. Continued employment without a weekly break leads to breakdown of workers and production levels.

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21 States and the District of Columbia in their labor laws have limited the number of days in succession a woman may work, usually to 6 days out of 7.

3. A MEAL PERIOD OF AT LEAST 30 MINUTES -- during the workday should be required by law for all labor -- men and women. Food is the workers' fuel. Enough time -- at least 30 minutes -- for a nutritious meal -- helps to prevent fatigue and indigestion, and to increase energy and output.

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25 States, the District of Columbia, and Puerto Rico require an interval for meals.

4. TWO 10-MINUTE REST PERIODS -- (one in each half of the workday) could and should be stipulated by law for women in industry. Women tend to tire more quickly than men, and a brief rest picks up the worker and keeps up the output.

Only about 3 States by regulation require for some types of women workers such a rest period in each half of the workday.

5. MINIMUM WAGE LEGISLATION -- is necessary to prevent unduly low wages for women. Such a safeguard is a benefit to all. It sets a floor to wage standards in general. It guarantees women workers enough pay for the bare essentials of living. It protects employers from unfair competitors. It helps to reduce relief rolls and thus to lighten the burdens on the community and tax payers.

The Federal Fair Labor Standards Act sets a floor to wages of men and women. It prohibits sex differentials in the minimum rates. The Public Contracts Act requires workers to be paid prevailing minimum rates as determined by the Secretary of Labor.

A minimum wage law applying to women is found in 26 States, the District of Columbia, Alaska, Hawaii, and Puerto Rico. Such a State law is an essential safeguard to wages of women in such intra-State industries as stores, laundries, hotels, restaurants, beauty shops, and so on, not covered by the Federal law. In some States having a minimum wage law, orders to cover women in certain industries have not yet been issued, and in most States some types of women workers, notably household employees and farm workers who need such protection, are exempted from the law.

6. ABOLITION OF INDUSTRIAL HOMEWORK — by law is the only sure solution to the problems connected with this system. Doing factory work in homes breeds such sweatshop practices as: Low pay, long hours, night work, child labor, bad working conditions. It tends to break down the health of the workers and the standards in the home. It undermines standards for factory workers. Legal regulation of the system helps to reduce but does not prevent wrong practices.

The Federal Fair Labor Standards Act exercises control over the system, in requiring the same minimum wage to homeworkers as factory workers and in setting up certain procedures to enforce this regulation. Orders issued by the Wage-Hour Division in administering the act practically ban homework in some industries. The Public Contracts Act prohibits homework on goods manufactured for the Government.

Of 20 States with some type of industrial homework law only a few control it to any considerable extent.

7. PLANT SAFETY, SANITATION, AND HYGIENE -- should be covered by State codes of detailed and compulsory regulations. Such requirements are essential to guarantee safe and healthful working conditions for all labor, to prevent absenteeism and labor turnover, waste of labor and loss in production. Increased efforts of this type to promote the workers' welfare are imperative in the war emergency because of the large numbers of new and inexperienced employees, including many women, working on unusual industrial processes for the first time. State codes should cover such matters as:

Safe and adequate buildings
Clean, well-ventilated, properly heated premises
Guarded machinery and safety practices
Protection against fire, excessive speed, muscular strain, lifting of unduly heavy weights; against explosives, dust, fumes, acids, or other harmful substances or conditions
Sanitary and satisfactory drinking, washing, and toilet facilities
Scientific lighting and ventilating arrangements for different types of work
Adequate seating for women workers
First-aid equipment and treatment and any essential medical care in the plant

The Public Contracts Act is the most important Federal law helping to promote for women workers safe and healthful working conditions. In Government contracts (of more than $10,000) the act prohibits the manufacture of goods under dangerous or insanitary working conditions.

The question of State legislation in this field is too complex and varied for discussion here. The different States vary considerably in regard to the

adequacy of such regulations. A considerable number of States have set up boards or commissions with broad powers to formulate and enforce health regulations for industry. In some cases codes have been established by these agencies for specific occupations, such as the operation of abrasive wheels; in others, for specific hazards, such as work with lead; in still others, for industries, such as mining, chemical manufacture, and so on. The code method of regulation has proved very effective. It makes possible action as the need in industry arises, without the delayed legislative procedure.

8. WORKMEN'S COMPENSATION LEGISLATION -- is an essential method of requiring special benefits to be paid workers who incur disabilities as a result of their jobs. A fair amount of compensation should be paid both women and men for industrial injuries and occupational diseases to help them meet such emergencies. The system of basing compensation of this type on the worker's wage is an added argument against the double wage standard -- one set of rates for men and a lower set for women -- still found in many plants.

The United States Employees' Compensation Act (and amendment) is the chief Federal legislation of this type. It provides benefits for civilian employees of the United States Government, suffering from injuries or occupational disease sustained while in performance of duty -- (for example, workers in arsenals and quartermaster depots, and other workers within the jurisdiction of the Federal Government.)

Every State but one has a workmen's compensation act covering workers injured in industrial accidents. In only half the States and the District of Columbia does the law apply to occupational disease. The compensation laws do not cover all employments. Two types of workers who are generally not covered by workmen's compensation laws and who need such protection are household workers and farm workers.

Mrs Mayer
1421

9. EMPLOYMENT SECURITY -- including public employment service and unemployment insurance, is an essential type of legal safeguard for wage earners. Without such assistance many are unable to find jobs, and because of insufficient earnings, can not save enough to tide themselves over a period of unemployment.

The United States Employment Service furnishes free service through its Nation-wide network of local offices, to help workers to get jobs and employers to get workers. The machinery for an unemployment insurance system, as set up by the Federal Social Security Act, has led to the enactment of an unemployment compensation law by every State and Territory. These laws follow a general pattern, though many provisions differ. In general the laws exempt the same types of workers, some of whom authorities agree should be covered eventually after development of the necessary administrative procedures.

10. OLD AGE AND SURVIVORS INSURANCE -- as a system compulsory by law is essential to help workers to provide for themselves and families when their wage-earning stops due to old age or death.

The Federal Social Security Act has set up such a system operated by the Federal Government on a Nation-wide scale for many kinds of employees. Other types of workers (including household employees and farm workers) now exempted, could and should be covered, if and when Congress takes the necessary action recommended by President Roosevelt and the Social Security Board.

11. VOCATIONAL REHABILITATION -- is necessary as a legal measure to help disabled people to secure treatment and training, enabling them to return to a normal self-supporting life, in all possible cases.

The Federal-State program established years ago through special legislation to guarantee vocational rehabilitation was provided more recently with additional funds through the Social Security Act.

12. COMPULSORY HEALTH INSURANCE -- should be established by law to enable workers to receive cash benefits and essential medical care in case of illness. Such a system should cover pregnancy of women workers. Insurance of this type guarantees benefits during an emergency when expenses increase and wages are often cut off.

No State or Federal legislation of this type exists in this country, though such laws are in effect in a number of other countries.

13. WORKERS' RIGHT TO SELF ORGANIZATION AND COLLECTIVE BARGAINING -- established by law is a necessary safeguard in our present industrial system when individual workers are unable to settle difficulties for themselves, and when collective action by labor can, at one time, adjust questions relating to many workers, and save time for management. Such a measure helps to prevent unfair employer practices and to promote better industrial relations.

The Federal Government through its National Labor Relations Act guarantees workers in all employment "affecting commerce" the right to organize and bargain collectively with employers.

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8 States have passed State Labor Relations Acts differing in some respects from the Federal Act.

For further details write to:

WOMEN'S BUREAU
United States Department of Labor
Washington, D. C.

Memo 9
11/17/42

LABOR LAWS FOR WOMEN
ADVOCATED BY
THE WOMEN'S BUREAU, U. S. DEPARTMENT OF LABOR

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N.Y. yes — see p. 17

6. ABOLITION OF INDUSTRIAL HOMEWORK — by law is the only sure solution to the problems connected with this system. Doing factory work in homes breeds such sweatshop practices as: Low pay, long hours, night work, child labor, bad working conditions. It tends to breakdown the health of the workers and the standards in the home. It undermines standards for factory workers. Legal regulations of the system help to reduce but do not prevent wrong practices.

The Federal Fair Labor Standards Act exercises control over the system, in requiring the same wage rates to home workers as factory workers. Orders issued by the Wage-Hour Division in administering the act practically ban home work in some industries. The Public Contracts Act prohibits home work on goods manufactured for the Government. Of 20 States with some type of industrial home work law only a few control it to any considerable extent. The Federal regulations, which apply to home work done in any State or sent across State lines, are more comprehensive and effective.

Public Contracts prohibits homework. How does it enforce this?

Date effective	Certificates required in
12/1/42	Women's Apparel
9/21/42	Gloves
11/3/41	Jewelry
~~Not yet~~	~~Hats~~ no order in effect
12/1/42	Knit outerwear

Can find no summary on this. These are all I find

7. PLANT SAFETY, SANITATION, AND HYGIENE-- should be covered by State codes of detailed and compulsory regulations. Such requirements are essential to guarantee safe and healthful working conditions for all labor, to prevent absenteeism and labor turnover, waste of labor and loss in production. Increased efforts of this type to promote the workers' welfare are imperative in the war emergency because of the large numbers of new and inexperienced employees, including many women, working on unusual industrial processes for the first time.

State codes should cover such matters as:

Safe and adequate buildings

Clean, well-ventilated, properly heated premises

Guarded machinery and safety practices

Protection against fire, excessive speed, muscular strain, lifting of unduly heavy weights, explosives, dust, fumes, acids, or other harmful substances or conditions

Sanitary and satisfactory drinking, washing, and toilet facilities

Scientific lighting and ventilating arrangements for different types of work

Adequate seating for women workers

First-aid equipment and treatment and any essential medical care in the plant

The Public Contracts Act is the most important Federal law helping to promote for women workers safe and healthful working conditions. The act prohibits contracts (of more than $10,000) to be awarded for goods if manufactured under dangerous or insanitary working conditions. ~~In view of the xxxxxxxx~~ Federal Government's ~~large number of war orders the Act at present is particularly far reaching~~ in coverage.

The question of State legislation in this field is too complex and varied for discussion here. The different States vary considerably in regard to the adequacy of such regulations. A considerable number of States have set up boards or commissions with broad powers to formulate and enforce health regulations for industry. In some cases codes have been established by these agencies for specific occupations, such as the operation of abrasive wheels; in others for specific hazards such as work with lead presents; in still others for industries such as mining, chemical manufacture, and so on. The code method of regulation has proved very effective. It makes possible action as the need in industry arises without the delayed legislative procedure.

8. WORKMEN'S COMPENSATION LEGISLATION is an essential method of requiring special benefits to be paid workers who incur disabilities as a result of their jobs. A fair amount of compensation should be paid both women and men for industrial injuries and occupational diseases to help them meet such emergencies. The system of basing compensation of this type on the worker's wages is an added argument against the double wage standard -- one set of rates for women and a lower set for men -- still found in many plants.

The Federal Employees Compensation Act provides benefits for civilian employees of the United States Government suffering injuries or occupational disease in performance of official duties -- (for example, in arsenals and quartermaster depots) and workers in private employment within the jurisdiction of the Federal Government. Two Federal laws relate to occupational disease.

Every State but one has a workmen's compensation act covering for most types of employment, workers injured in industrial accidents. In only half the States and the District of Columbia does the law apply to occupational disease. The compensation laws do not cover all employments. Two types of workers who are generally not covered by workmen's compensation laws and who need such protection are household employees and farm workers.

the United States Employees' Compensation
act Carol Amendment is —
the chief Federal legislation of this
type for women, 1936 *

9. EMPLOYMENT SECURITY -- including public employment service and unemployment insurance is an essential type of legal safeguard for wage earners. Without such assistance many are unable to find jobs for themselves, and because of insufficient earnings, can not save enough to tide over a period of unemployment, even for which they are not responsible.

Insert

The United States Employment Service (as reorganized by the Wagner Peyser Act of Congress) furnishes free service through its nation-wide network of local offices to help workers to get jobs and employers to get workers. The machinery for an unemployment insurance system, as set up by the Federal Security Act, has led to the enactment of an unemployment compensation law by every State and Territory. These laws follow a general pattern though many provisions differ. In general the laws exempt casual types of workers, some of whom authorities agree should be covered eventually after development of the reasoning and administrative procedures.

to a normal self-supporting life, in all possible cases.

9. EMPLOYMENT SECURITY -- including public employment service and unemployment insurance is an essential type of legal safeguard for wage earners. Without such assistance many are unable to find jobs for themselves, and because of insufficient earnings, can not save enough to tide over a period of unemployment, even for which they are not responsible. The Federal Social Security Act has set up the United States Employment Service with its network of local offices. As a result of this act an unemployment compensation law has been passed by every State and territory. Among types of workers whom these laws do not now cover but to whom they should apply (according to recommendations by various authorities, including President Roosevelt and the Social Security Board) are household employees, and farm workers. Coverage of these workers is possible through State action alone.

10. OLD AGE AND SURVIVORS INSURANCE -- as a system compulsory by law is essential to help workers to provide for themselves and families, when their wage-earning stops due to old age or death.

The Federal Social Security Act has set up such a system operated by the Federal Government on a nation-wide scale for many kinds of employees. Other types of workers (including household employees and farm workers) now exempted, could and should be covered, if and when Congress takes the necessary action recommended by President Roosevelt and the Social Security Board.

11. VOCATIONAL REHABILITATION -- is a necessary legal measure to help disabled people to secure treatment and training to enable them to return to a normal self-supporting life, in all possible cases.

The Federal-State program established years ago through special legislation to guarantee vocational rehabilitation was provided more recently with additional funds through the Social Security Act.

39-II p. 98

12. COMPULSORY HEALTH INSURANCE -- should be established by law to enable workers to receive cash benefits and essential medical care in case of illness. Such a system should cover pregnancy of women workers. Insurance of this type guarantees benefits during an emergency when expenses increases and wages are often cut off.

Unemployment Compensation for pregnancy not otherwise adequately covered in states

No State or Federal legislation of this type exists in this country, though such laws are in effect in a number of other countries.

74 40 p. 20

13. WORKERS' RIGHT TO SELF ORGANIZATION AND COLLECTIVE BARGAINING -- established by law is a necessary safeguard in our present industrial system when individual workers are unable to settle difficulties for themselves, and when collective action by labor can at one time adjust questions relating to many workers, and save time for management. Such a measure helps to prevent unfair employer practices and to promote better industrial relations.

The Federal Government through its National Labor Relations Act ~~has safeguarded~~ workers in all employment affecting commerce" the right to organize and bargain collectively ~~for workers in interstate industries.~~ with employers.

Upheld from N.R.A. decision made on certain grounds

Old by a, and so

7 States have passed a State Labor Relations Act to supplement the Federal Act by covering other types of employment (with certain exceptions) not affected by the Federal Act.

Final for Mimeographing

WOMEN'S BUREAU
U. S. Department of Labor
Washington

September 1, 1942

EXEMPTIONS FROM STATE HOUR LAWS
FOR WOMEN AND MINORS (16 YEARS AND OVER) IN WAR ~~PRODUCTION~~ manufacturing

I. Night Work Laws:

A. Of the 11 States with laws or orders prohibiting the employment of women at night in manufacturing, all now provide for exemption for women over 21 in war production. In most States, the employer is first required to obtain a permit from the State labor department (see note at end of article).

1. Night work prohibited or restricted by general statute:

a. Law expressly provides for exemption:

Connecticut (10 p.m. to 6 a.m.) females and minors under 18
Massachusetts (10 p.m. to 6 a.m., except leather; females 16 and over ~~6 p.m.~~ to 6 a.m., leather manufacturing)
Nebraska (1 a.m. to 6 a.m.) females 16 and over
New Jersey (12 midnight to 7 a.m.) females over 18
New York (10 p.m. to 6 a.m.) females over 21

b. Action taken by Governor or State labor department to relax law:
Delaware (10 p.m. to 6 a.m.) females 16 and over
Indiana (12 p.m. to 6. a.m.) females 18 and over
Pennsylvania (12 p.m. to 6 a.m.) females 21 and over

2. Night work prohibited or restricted by State labor department order:

a. Action taken by State labor department to relax permit ~~order~~:

California (12 p.m. to 6 a.m.) females 18 and over
Kansas (9 p.m. to 6 a.m.) females; minors 16 to 18
Wisconsin (6 p.m. to 6 a.m.) females 16 and over

B. Seventeen States and the District of Columbia establish night work limitations for minors 16 and over different from limitations for adult women. State policy in general is against relaxation of provisions for such workers:

Arizona (7 p.m. to 7 a.m.) girls under 18
Arkansas (9 p.m. to 7 a.m.) females under 18
California (10 p.m. to 6 a.m.) minors under 18
District of Columbia (7 p.m. to 7 a.m.) girls under 18
(10 p.m. to 6 a.m.) boys 16 to 18
Florida (10 p.m. to 6 a.m.) minors 16 to 18
Indiana (7 p .m. to 6 a.m.) girls under 18

Louisiana (6 p.m. to 7 a.m.), females under 18
Michigan (6 p.m. to 6 a.m.), females under 18
New Jersey (10 p.m. to 6 a.m.), minors 16 to 18
New York (12 p.m. to 6 a.m.), males 16 to 18
(9 p.m. to 6 a.m.), females 16 to 21
North Carolina (9 p.m. to 6 a.m.), girls 16 to 18
(12 p.m. to 6 a.m.), boys 16 to 18

Ohio (10 p.m. to 6 a.m.), girls 18 to 21, boys 16 to 18
(6 p.m. to 7 a.m.), girls under 18
Oklahoma (6 p.m. to 7 a.m.), girls under 18
Massachusetts (6 p.m. to 6 a.m., textiles), girls 16 to 21, boys 16 to 18
Pennsylvania (9 p.m. to 6 a.m.), females 16, under 21
Utah (6 p.m. to 7 a.m.), girls under 18
Washington (7 p.m. to 6 a.m.), minors under 18
Wyoming (10 p.m. to 7 a.m.), females under 18

II. Maximum Hour Laws:

A. Of the 21 States and District of Columbia in which the maximum work week for women is 48 hours or less, 17 States now permit women to be employed in war production longer than the established standard. In most States, the employer is first required to obtain a permit from the State labor department.

1. Law or order expressly provides for exemptions:

Conn.
La. (overtime at time and ½)
Mass.
Nev. (overtime at time and ½)
N. H.
N. Mex. (overtime 2 hrs. a week only; time and ½)
N. Y.
Oreg. (I.W.C. Order, 44 hour week, overtime at time and ½)
Pa. (44 hr. [redacted] overtime at time and ½)
Utah
Va.
Wyo. (overtime at time and ½)

2. Action taken by Governor or State labor department to relax [redacted]:

Calif.
Ill.
Ohio (45 hr. week)
R. I.
Wash.

3. No relaxation:

Ariz.
N. Car.
N. Dak.
S. Car. (40 hour week, men and women, textiles only) 1/
District of Columbia

B. Of the 25 States which establish maximum work weeks of over 48 hours, 11 States permit longer than standard hours for women in war production. The employer is usually required to obtain a permit from the State labor department.

1. Law or order expressly provides for exemption:

Kan. (Labor Dept. Order, 49½ hr. wk.)

1/ Legal status doubtful.

Minn. (54 hr. law)
Miss. (60 hr. law)
Texas (54 hr. law; overtime at double pay)
Vt. (50 hr. law)
Wis. (50 hr. law; overtime at time and ½)

2. Action taken by Governor or State labor department to permit relaxation:

Ark. (54-hour law)
Colo. (8-hour day; no weekly maximum set)
Nebraska (54 hr. law)
Mich. (54 " ")
Mont. (8 hr. day; no weekly maximum set)

3. No relaxation:

Del. (55 hr. law)
Ga. (60 hr. law; men & women; cotton & woolen mfg.)
Idaho (9 hr. day; no weekly maximum set)
Ken. (60 hr. law)
La. (54 hr. law, 6000 or less pop.)
Maine (54 hr. law)
Md. (60 hr. law)
Mo. (54 hr. law [no weekly maximum set])
North Carolina (55 hr. law; women; firms with 8 or fewer; men; all firms)
N. J. (54 hr. law)
Okla. (54 hr. law)
S. Carolina (55 hr. law; men and women, cotton and woolen hosiery)
S. Dak. (54 hr. law)
Tenn. (57 hr. law)

C. Five States do not limit the length of the work day or work week:

Ala.
Fla.
Indiana
Iowa
W. Va.

D. Six States establish maximum weekly hour limitations for minors 16 and over different from such limitations for adult women. State policy in general is against relaxation of maximum hour laws for minors.

Indiana (48 hour week) girls under 18
Louisiana (44 hour week) minors under 18
New Jersey (40 hour week) minors under 18
North Carolina (48 hour week) minors 16 to 18
Utah (44 hour week) minors under 18
Wisconsin (40 hour week) minors under 18

III. Day of Rest Laws:

A. Of the 20 States and District of Columbia which require one day of rest in seven for women employed in manufacturing, 18 States now permit women to be employed on 7 days in war production. The employer is usually required to obtain a permit from the State labor department.

1. Law or order expressly provides for exemptions:

Ariz.
Calif. (men and women)
Kan. (Labor Dept. Order)
Conn. (men and women)
Louisiana
Mass. (men and women)
N. H. (" " ")
N. Y. (men and women)
N. Dak.
Oreg. (I.W.C. Order)
Pa.
S. Car. (5-day week, men and women, textiles only)
Wash. (I.W.C. order)
Wis. (men and women)

2. Action taken by Governor or ~~Commission~~ State labor dept to relax permit ~~tion~~:

Ark.
Del.
Ill. (men and women)
Ohio

3. No relaxation:

N. J.
N. Car.
D. C.

B. State policy in general is against relaxation of day of rest laws as they apply to minors. In addition to the laws listed above, 2 States have day of rest laws for minors.

Indiana (girls under 18)
Utah (minors under 18)

1/ Legal status doubtful.

- - - - - - - - - - - - - - -

NOTE:

Permits: Most State labor departments, in handling requests for exemptions, are following the procedure recommended by the U. S. Department of Labor: (1) The employer makes an application to the State labor department setting out the existence of a war contract and the need for an exemption; (2) The State labor department makes an investigation to determine such need, taking into consideration such factors as the existence of a labor shortage, the possibility of more efficient operation of the employer's plant and more adequate training facilities.

Permits are issued only for war production work, and usually only for a specified period of time.

WOMEN'S BUREAU
U. S. Department of Labor
Washington

July 1, 1942

STATE HOUR LAWS FOR WOMEN AND MINORS (16 YEARS AND OVER) IN MANUFACTURING: PROVISIONS FOR EXEMPTIONS

I. Night Work Laws:

A. Of the 11 States with laws prohibiting the employment of women at night in manufacturing, all now permit exemptions for women over 21 in war production:

1. Night work prohibited or regulated by general statute:

a. Law expressly provides for exemption:

- Connecticut (10 p.m. to 6 a.m.), women and minors under 18
- Delaware (10 p.m. to 6 a.m.), women 16 and over
- New Jersey (12 midnight to 7 a.m), [redacted] females over 18
- New York (10 p.m. to 6 a.m.), women 21 and over

b. Action taken by Governor or Commission to relax law:

- Indiana (12 p.m. to 6 a.m.), women 18 and over
- Massachusetts (10 p.m. to 6 a.m.), females 16 and over
- Nebraska (1 a.m. to 6 a.m.), women 16 and over
- Pennsylvania (12 p.m. to 6 a.m.), women 21 and over

2. Night work prohibited or restricted by Commission order:

a. Action taken by Commission to relax order:

- California (12 p.m. to 6 a.m.), women 18 and over
- Kansas (9 p.m. to 6 a.m.), women; minors 16 to 18
- Wisconsin (6 p.m. to 6 a.m), females 16 and over

B. Sixteen States and the District of Columbia have special night work laws for minors. State policy in general is against relaxation of provisions for such workers:

Arizona (7 p.m. to 7 a.m.), girls under 18
Arkansas (9 p.m. to 7 a.m.), females under 18
California (10 p.m. to 6 a.m.), [redacted] minors under 18
District of Columbia (7 p.m. to 7 a.m.), girls under 18
(10 p.m. to 6 a.m.), boys 16 to 18
Florida (10 p.m. to 6 a.m.), minors 16 to 18
Indiana (7 p.m. to 6 a.m.), girls under 18

Where plant operates 2 shifts of not more than 8 hours each and not more than 5 days a week.

Louisiana (6 p.m. to 7 a.m.), ~~minors~~ females under 18
Michigan (6 p.m. to 6 a.m.), females under 18
New Jersey (10 p.m. to 6 a.m.), minors 16 to 18
New York (12 ~~p.m.~~ midnight to 6 a.m.), males 16 to 18
9 (10 p.m. to 6 a.m.), females ~~over~~ 16 to 21
North Carolina (9 p.m. to 6 a.m.), girls 16 to 18
(12 midnight to 6 a.m.), boys 16 to 18

Ohio (10 p.m. to 6 a.m.), ~~women~~ 18 to 21, boys 16 to 18
(6 p.m. to 7 a.m.) ~~(9 p.m. to 6 a.m.)~~, girls ~~16 to 18~~ under 18
Oklahoma (6 p.m. to 7 a.m.), girls under 18
Pennsylvania (9 p.m. to 6 a.m.), females ~~under 18~~ 16, under 21
Utah (6 p.m. to 7 a.m.), girls under 18
Washington (7 p.m. to 6 a.m.), minors under 18
Wyoming (10 p.m. to 7 a.m.), females under 18

(Massachusetts (6 p.m. to 6 a.m.) in textile) girls 16 to 21, boys 16 to 18.

NY
sec. 172
see 1942, ch 778

HB 7835. NYA4-1940 with 41 supp
Labor Law
Factories -
170. under 16 5 PM to 8 AM
171 females 16-18 mid to 6 AM
172 females 16 to 21 9 to 6
173 " over 21 10 to 6

II. Maximum Hour Laws:

A. Of the 22 States and District of Columbia in which the maximum work week for women is 48 hours or less, 18 States now permit women to be employed in war production longer than the established standard:

1. Law expressly provides for exemptions:

Colo. (I. C. order) (8 hrs., 6 days)
Conn.
La. (overtime at time and 1/2)
Mass.
Nev. (overtime at time and 1/2)
N. H.
N. M. (overtime at time and 1/2)
N. Y.
Oreg. (I.W.C. Order, 44 hrs; overtime at time and 1/2)
Utah
Va.
Wyo. (overtime at time and 1/2)

2. Action taken by Governor or Commission to relax law:

Calif.
Ill.
Ohio (45 hr. law)
Pa. (44 hr. law) overtime at time and 1/2
R. I.
Wash.

3. No relaxation:

Ariz.
N. Car.
N. Dak.
S. Car. (40 hrs., textiles only)
District of Columbia

B. Of the States in which the maximum work week for minors is 48 hours or less but a longer work week is permitted for women, 9 States permit minors to be employed over 48 hours.

Ind. (48 hrs.) Girls under 18
Louisiana (48 hrs.) Girls under 18
N. Y. (48 hrs.) Minors under 18
N. J. (40 hrs.) Minors under 18
Wis. (40 hrs.) " 16 to 18. Law permits 48 hrs. in war emergency.
Utah (44 hrs.) " under 18
Va. (48 hrs.) Girls under 18

C. Of the 22 States which establish maximum work weeks over 48 hours, 11 States permit longer than standard hours for women in war work:

1. Law expressly provides for exemption:

Ark. (54 hr. law)
Kan. (Labor Dept. Order, 49 1/2 hr. wk.)
Ga. (60 hr. law, men & women) Cotton & woolen mfg.

1/ Legal status of this law is doubtful at this time.

Minn. (54 hr. law)
Miss. (60 hr. law)
Texas (54 hr. law)
Vt. (50 hr. law)
Wis. [redacted] 50 hrs.)

2. Action taken by Governor or Commission to relax law:

Nebraska (54 hr. law)
Mich. " " "

3. No relaxation:

Ga. (60 hr. law; men and women, cotton and woolen mfg.)
Del. (55 hr. law)
Idaho (9 hr. day)
Kan. (60 hr. law)
La. (54 hr. law, 6000 or less pop.)
Maine (" " ")
Md. (60 hr. law)
Mo. (54 hr. law)
Montana (8 hr. law)
North Carolina (55 hr. law, firms with 8 or fewer)
N. J. (54 hr. law)
Okla. (54 hr. law)
S. Carolina (cotton and woolen hosiery) (55 hr. law, men and women,
S. Dak. (54 hr. law)
Tenn. (57 hr. law)

D. C. 5 States do not limit the length of the work week:

Ala.
Fla.
Indiana
Iowa
W. Va.

III. Day of Rest Laws:

A. Of the 21 States and District of Columbia which require one day of rest in seven for women employed in manufacturing, 18 States now permit women to be employed on 7 days in war production:

1. Law expressly provides for exemptions:

Ariz.
Calif. (men and women) (also Ind. Comm. order)
~~Colo. (Com. order)~~
Conn. (men and women)
Louisiana
Mass. (men and women)
N. H. (" " ")
N. Y. (men and women) (also separate laws for W)
N. Dak.
Oreg. (I.W.C. Order)
Pa. 5-day week — (men and women)
S. Car. (- textiles mfg.)
Wash. (women over 18)
Wis. (men and women)

2. Action taken by Governor or Commission to relax law:

Ark.
Ill. (men and women)
Kan. (Labor Dept. Order)
Ohio

3. No relaxation:

Del.

Minors

Ark (pers 16-18)
DC (minors - 18) add
~~Ind (girls - 18)~~
Mass (boys 16-18; girls 16-21) (Gov to relax)
NJ (minors - 18)
NC (minors 16-18)
Ohio (boys - 18; girls - 21)
Ore (minors - 18) (2)
Pa (minors - 18) (2)
Utah (boys 16 - girls 18 & over)
Wash (minors - 18)
Wisc (minors 16 & 18)

and DC

16 and over

es with special day of rest laws for minors, no State ation for minors:

sons bt. 16 and 18)
ls under 18)
or Dept. Order) (Minors 16 and 18)
ors under 18
ales under 18)

Mass One (minors under 18) not checked Ark Alaska

of this law is doubtful at this time.

III. Day of Rest Laws:

A. Of the 21 States and District of Columbia which require one day of rest in seven for women employed in manufacturing, 18 States now permit women to be employed on 7 days in war production:

1. Law expressly provides for exemptions:

Ariz.
Calif. (men and women)
~~Colo. (Com. order)~~
Conn. (men and women)
Louisiana
Mass. (men and women)
N. H. (" " ")
N. Y. (men and women)
N. Dak.
Oreg. (I.W.C. Order)
Pa.
S. Car. (men and women)
Wash. (women over 18)
Wis.

2. Action taken by Governor or Commission to relax law:

Ark.
Ill. (men and women)
Kan. (Labor Dept. Order)
Ohio

3. No relaxation:

Del.
N. Car.
N. J.
D. C.

B. Of the 6 States with special day of rest laws for minors, no State permits relaxation for minors:

~~Ariz.~~ (persons bt. 16 and 18)
Ind. (girls under 18)
Kans. (Labor Dept. Order)(Minors 16 and 18)
N. Y. (Minors under 18
Pa. (Females under 18)

V Legal status of this law is doubtful at this time.

Mrs. Batson

D. 6 States establish maximum weekly hour limitations for minors 16 and over different from such limitations for adult women. State policy in general is against relaxation of maximum hour laws for minors:

Indiana (48 hour week; girls under 18)
Louisiana (44 hour week; minors under 18)
New Jersey (40 hour week; minors under 18)
North Carolina (48 hour week; minors 16 to 18)
Utah (44 hour week; minors under 18)
Wisconsin (40 hour week; minors under 18)

B. State policy in general is against relaxation of day of rest laws as they apply to minors. In addition to the laws listed under A above, 2 States have day of rest laws for minors:

Indiana (girls under 18)
Utah (minors under 18)

Drawer C - McKelvey (modific. folder)

Include laws hrs. longer than 48.
Standards April 18" list.
Practices as of April '42 also indicating legis. changes

To be revised

U. S. DEPARTMENT OF LABOR
WOMEN'S BUREAU
Washington

STATE HOUR LAWS FOR WOMEN
POSSIBLE EXEMPTIONS IN PERIODS OF EMERGENCY IN MANUFACTURING INDUSTRIES
January 1, 1942

Revised

I. Night-Work Laws for Women.

1. California

a. The manufacturing wage order of Industrial Welfare Commission of California prohibits night work for women unless a permit from the Commission has been issued, and requires that all such work "shall be paid for at not less than rate and one-half of the day rates." (Section 10 (d) of Order No. 11a.)

Mfg. order Jan. 1942

b. On December 18, 1941, Mrs. Margarete L. Clark, Chief of Division of Industrial Welfare, wrote to the 6 major aircraft companies of Southern California granting them permission to employ women at night without paying time and one-half the day rate.

c. On December 27, 1941, the Commission voted 3 to 2 to deny the request of the aircraft and rubber industries to repeal or amend Section 10 (d) of Order 11a of the Industrial Welfare Commission.

This action was taken by the Commission because it had been advised by counsel that if the request were granted the Commission "would exhaust its jurisdiction to write new orders." A new order for manufacturing will be promulgated on February 15, 1942.

d. Mrs. Clark's letter granting permission to the aircraft industry to employ women at night still stands.

2. Connecticut

a. The law prohibits the employment of women between 10 p.m. and 6 a.m.

b. During the World War this law was amended to permit the Governor in the event of war or other serious emergency, to suspend the limitations upon night work. This amendment is still in effect.

3. Delaware

a. The law of Delaware prohibits the employment of women between 10 p.m. and 6 a.m. (except in canneries and continuous occupations).

b. This law has not been modified and no relaxation has been granted.

4. Indiana

a. The law prohibits the employment of women between 10 p.m. and 6 a.m., except in establishments operating two shifts of not over 8 hours each and on not over 5 days a week women may be employed until 12 o'clock midnight.

b. The Commissioner of Labor on December 11, 1941, announced that this law would "not be enforced against employers employing women in the production of materials needed for national defense while the Nation is at war." Thorough investigation of each establishment employing women at night is to be made.

5. Kansas

a. The Industrial Welfare Order No. 2 of Kansas for the manufacturing industry prohibits the employment of women between 9 p.m. and 6 a.m.

b. On December 9, 1941, the Commissioner of Labor of Kansas announced that, upon application and "clear showing" of need, permission would be granted to establishments engaged in defense production to employ women after 9 p.m.

Louisiana - Under 18 = Before 7:00 a.m. after 6:00 P.M.

6. Massachusetts

a. The law of Massachusetts prohibits the employment of women between 10 p.m. and 6 a.m.

b. Under the emergency powers of the State, permits so far issued by the Labor Commissioner have authorized the employment of women only up to 12 o'clock midnight.

7. Nebraska

a. The law prohibits the employment of women between 1 a.m. and 6 a.m. in metropolitan and first-class cities, except when a permit has been issued by the Commissioner of Labor authorizing employment during these hours.

b. Investigations of working conditions are made before permits are issued.

8. New Jersey

a. The law of New Jersey prohibited the employment of women between 12 o'clock midnight and 7 a.m. (except in canneries and glass factories).

8. New Jersey—continued

b. On December 12, 1941, the Governor of New Jersey approved an amendment to the law which provides that the prohibition against employment of women at night can "be suspended by the Governor, on his own order or upon application to him, in time of war or other serious national emergency. Such order shall be limited to a particular period of time and shall be limited to a particular manufacturing establishment."

c. In putting this new provision into effect the Labor Commissioner of New Jersey has adopted the following procedure:

(1) Application to the Commissioner of Labor for authority to employ women at night.

(2) Investigation of each application.

(3) Permission granted only on showing of need.

9. New York

a. The law of New York prohibits the employment of women over 21 years of age between 10 p.m. and 6 a.m. and women under 21 years between 9 p.m. and 6 a.m.

(21?) not related.

b. On December 12, 1941, the Governor of New York announced that employers engaged in war production could apply to the State Department of Labor for authority to—

Wesfensatin law.

"(1) Operate on a 7-day week;

"(2) Employ women on a 3-shift basis;

"(3) Waive other provisions of the law restricting hours of employment."

c. All applications must be investigated and permits issued only when the necessity for exemption is proved.

10. Ohio

a. The law of Ohio prohibits the employment of women between the ages of 18 and 21 before the hour of 6 a.m. or after 10 p.m.

b. This law has not been modified and no relaxation has been granted.

Laws for girls - under 21 or 18.

11. Pennsylvania

a. The law of Pennsylvania prohibits the employment of women (over 21 years) of age in any manufacturing establishment between 10 p.m. and 6 a.m.; except employment until 12 midnight in establishments operating two shifts of not more than 8 hours each and on not more than 5 days. The law also prohibits the employment of women under 21 years of age between 9 p.m. and 6 a.m.

b. On December 18, 1941, the State Industrial Board of Pennsylvania approved the following Regulation of the Department of Labor and Industry.

> "Rule G-15.—Employers actively participating in the Defense Program may employ females over 21 years of age beyond the limits prescribed by the Women's Law when application for such permission has been approved by the Secretary of Labor and Industry, under a procedure to be established by the Department and ratified by the Industrial Board, provided that no such permission shall be granted to employ women for more than 48 hours in 6 days of any week and provided further that time and one-half time is paid for all hours worked over 44 in any week.
>
> "The relief granted by the provisions of this rule is effective only so long as the necessity therefor is existent in the successful conduct of the defense program."

12. Wisconsin

a. An order of the Industrial Commission prohibits the employment of women between 6 p.m. and 6 a.m. (except office workers).

b. Upon application and after the need has been determined by investigation the Commission permits plants with defense contracts to employ women at night.

II. Hour Laws.

1. The following States limit the weekly hours that women may be employed in manufacturing to 48 or less. 1/

(1)	Arizona	(12)	North Dakota
(2)	California	(13)	Ohio (45 hours)
(3)	Connecticut	(14)	Oregon (44 hours)
(4)	Illinois	(15)	Pennsylvania (44 hours)
(5)	Louisiana	(16)	Rhode Island
(6)	Massachusetts	(17)	South Carolina (40 hours—applies to textile only)
(7)	Nevada		
(8)	New Hampshire	(18)	Utah
(9)	New Mexico	(19)	Virginia
(10)	New York	(20)	Washington
(11)	North Carolina	(21)	Wyoming

District of Columbia

2. Of these 21 States, the following having authority specified in the law to permit longer hours in manufacturing during an emergency or have indicated that permission to work longer hours will be granted.

a. Authority specified in the law.

(1) Connecticut
(2) Massachusetts (Extraordinary emergencies in businesses requiring shifts)
(3) Nevada (If time and one-half is paid)
(4) New Hampshire
(5) New Mexico (2 hours weekly if time and one-half is paid)
(6) Oregon (overtime, if time and one-half is paid for hours in excess of 44)
(7) Pennsylvania (If time and one-half is paid for hours over 44)
(8) Utah
(9) Wyoming (overtime, if time and one-half is paid)

b. Action taken since the declaration of war by Governor or Labor Commissioner to relax laws if necessary.

(1) Illinois
~~(2) Massachusetts~~
~~(3) New York~~
(4) Ohio
(5) Rhode Island

1/ Canning not included in "manufacturing" as used in the plant.

III. One-Day Rest in Seven.

1. The following States require one-day rest in seven for women employed in manufacturing 1/

(1) Arizona----------Women
(2) Arkansas----------Women
(3) California----------Women (Industrial Welfare Order)
Women and men (Law)
(4) Connecticut----------Women and men
(5) Delaware----------Women
(6) Illinois----------Women and men
(7) Kansas----------Women and minors (Commission of Labor and Industry Order)
(8) Louisiana----------Women
(9) Massachusetts---------Women and men
(10) New Hampshire---------Women and men
(11) New Jersey----------Women
(12) New York----------Women and men (Day-of-rest law)
Women (Hour law)
(13) North Carolina--------Women
(14) North Dakota----------Women
(15) Ohio----------Women
(16) Oregon----------Women (Industrial Welfare Order)
(17) Pennsylvania----------Women (5½ days a week)
(18) South Carolina----(a) Women (Sunday work illegal in manufacturing)
(b) Women and men (5 days a week in cotton, silk, rayon, woolen textile mills)
(c) Women and men (Sunday work illegal in textile manufacturing except in emergency, when time and a half must be paid)
(19) Washington----------Women
(20) Wisconsin----------Women and men

District of Columbia--Women.

1/ Canning not included in "manufacturing" as used in this chart.

2. Of the 20 States listed above the following have authority specified in the law to permit work on 7 days in manufacturing during an emergency or have indicated that permission will be granted. 1/

   a. Authority to permit 7 days employment during an emergency specified in the law in—

      (1) Arizona---------Women 2/
      (2) California------Women and men
      (3) Connecticut-----Women and men
      (4) Massachusetts---Women and men
      (5) New Hampshire---Women and men
      (6) Oregon----------Women
      (7) Pennsylvania----Women
      (8) South Carolina--Women and men
      (9) Wisconsin-------Women and men
      (10) North Dakota----Women 3/

   b. Action taken since declaration of war by governors or labor commissioners to relax law if necessary

      (1) Illinois
      (2) Massachusetts
      (3) New York

3. Of the 28 States not listed in No. 1 above, all but Idaho, Montana, Nevada, and Wyoming have legislation on their books prohibiting Sunday labor in general. Most of these laws have their origin in the old Puritan "blue laws", and provide for exceptions under various circumstances.

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1/ Canning not included in "manufacturing" as used in this chart.

2/ Women working 6 hours or less a day may be employed 7 days.

3/ Ten hours a day, 7 days a week allowed in emergency if 48 hours a week is not exceeded.